

# **Pillar Creek Hatchery Annual Management Plan, 2007**

by

**Steve Schrof**

and

**Gary Byrne**

July 2007

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries





## Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative		fork length	FL
deciliter	dL	Code	AAC	mid-eye-to-fork	MEF
gram	g	all commonly accepted		mid-eye-to-tail-fork	METF
hectare	ha	abbreviations	e.g., Mr., Mrs., AM, PM, etc.	standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted			
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.	<b>Mathematics, statistics</b>	
meter	m			<i>all standard mathematical</i>	
milliliter	mL	at	@	<i>signs, symbols and</i>	
millimeter	mm	compass directions:		<i>abbreviations</i>	
		east	E	alternate hypothesis	H <sub>A</sub>
		north	N	base of natural logarithm	<i>e</i>
		south	S	catch per unit effort	CPUE
		west	W	coefficient of variation	CV
		copyright	©	common test statistics	(F, t, $\chi^2$ , etc.)
		corporate suffixes:		confidence interval	CI
		Company	Co.	correlation coefficient	
		Corporation	Corp.	(multiple)	R
		Incorporated	Inc.	correlation coefficient	
		Limited	Ltd.	(simple)	r
		District of Columbia	D.C.	covariance	cov
		et alii (and others)	et al.	degree (angular)	°
		et cetera (and so forth)	etc.	degrees of freedom	df
		exempli gratia		expected value	<i>E</i>
		(for example)	e.g.	greater than	>
		Federal Information		greater than or equal to	≥
		Code	FIC	harvest per unit effort	HPUE
		id est (that is)	i.e.	less than	<
		latitude or longitude	lat. or long.	less than or equal to	≤
		monetary symbols		logarithm (natural)	ln
		(U.S.)	\$, ¢	logarithm (base 10)	log
		months (tables and		logarithm (specify base)	log <sub>2</sub> , etc.
		figures): first three		minute (angular)	'
		letters	Jan,...,Dec	not significant	NS
		registered trademark	®	null hypothesis	H <sub>0</sub>
		trademark	™	percent	%
		United States		probability	P
		(adjective)	U.S.	probability of a type I error	
		United States of		(rejection of the null	
		America (noun)	USA	hypothesis when true)	α
		U.S.C.	United States	probability of a type II error	
			Code	(acceptance of the null	
		U.S. state	use two-letter	hypothesis when false)	β
			abbreviations	second (angular)	“
			(e.g., AK, WA)	standard deviation	SD
				standard error	SE
				variance	
				population	Var
				sample	var
<b>Weights and measures (English)</b>					
cubic feet per second	ft <sup>3</sup> /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
nautical mile	nmi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
<b>Time and temperature</b>					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
degrees kelvin	K				
hour	h				
minute	min				
second	s				
<b>Physics and chemistry</b>					
all atomic symbols					
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt,				
	‰				
volts	V				
watts	W				



# ***FISHERY MANAGEMENT REPORT NO. 07-38***

## **PILLAR CREEK HATCHERY ANNUAL MANAGEMENT PLAN, 2007**

by

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and

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The Kodiak Regional Aquaculture Association (KRAA) funds the general operation of the Pillar Creek Hatchery and the facility's stocking and evaluation programs. The Alaska Department of Fish and Game, Division of Sport Fish, provides funding for the Chinook and Coho salmon projects. Past funding for the Chinook project was also provided by the Kodiak Sport Fish Association and the Kodiak Association of Charter Boat Operators. The Division of Commercial Fisheries provides material and financial support for the management of returning adult runs enhanced or rehabilitated by hatchery stocking projects.



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**PREFACE:**  
**EXECUTIVE SUMMARY, 2007, AND SUMMARY OF ACTIVE  
FISH TRANSPORT PERMITS**



**PILLAR CREEK HATCHERY ANNUAL MANAGEMENT PLAN  
EXECUTIVE SUMMARY, 2007.**

New Projects for 2007:

1. PCH will incubate and rear rainbow trout for eventual stocking into Kodiak Road System Lakes for the recreational sport fishery.
2. Fish transport permits were issued to stock Chinook salmon into the Olds and American Rivers.
3. A fish transport permit was issued to stock coho salmon into Chiniak Lake as part of the Kodiak Road System coho stocking program.

Cost Recovery Harvests for 2007: None Planned.

Stocking Location	Broodstock	Projected Enhanced Return	2007 Stocking (brood year 2006)	2007 Stocking (brood year 2005)	2007 Egg take Goals	2008 Stocking (brood year 2007)	2009 Stocking (brood year 2007)
<b>Sockeye:</b>							
Hidden Lake	Afognak Lake early run	5,000	480,000		650,000	500,000	
Little Waterfall Lake	Afognak Lake early run	4,100 <sup>a</sup>	240,000		325,000	250,000	
Big Waterfall Lake	Afognak Lake early run		90,000		130,000	100,000	
Crescent Lake	Afognak Lake early run	800	315,000		390,000	300,000	
<b>Total</b>	<b>Afognak Lake early-run</b>	9,900	1,125,000	0	1,495,000 <sup>b</sup>	1,150,000	0
Spiridon Lake	Saltery Lake late run	354,000	1,750,000		4,616,400	3,550,000	
Ruth Lake	Saltery Lake late run	4,000	50,000		65,000	50,000	
Jennifer Lake	Saltery Lake late run		270,000		357,600	275,000	
Little Kitoi Lake	Saltery Lake late run	3,700 <sup>c</sup>	<sup>d</sup>		785,000 <sup>d</sup>	600,000	
<b>Total</b>	<b>Saltery Lake late-run</b>	358,000	2,070,000	0	5,824,000	4,475,000	0
<b>Total Sockeye</b>		367,900	3,195,000	0	7,319,000	5,625,000	0
<b>Coho:</b>							
Mayflower Lake	Buskin Lake	466	6,500		7,200	6,500	
Island Lake	Buskin Lake	2,759	22,500	8,451	25,000	22,500	
Dark Lake	Buskin Lake	0	7,500		8,300	7,500	
Mission Lake	Buskin Lake	811	12,500		13,900	12,500	
Potato Patch Lake	Buskin Lake	617	9,500		10,500	9,500	
Big (Lily) Lake	Buskin Lake	1,192	10,000		11,000	10,000	
Southern Lake	Buskin Lake	landlocked	3,500		3,900	3,500	
Margaret Lake	Buskin Lake	landlocked	3,500		3,900	3,500	
Abercrombie Lake	Buskin Lake	landlocked	3,500		3,900	3,500	
Chiniak Lagoon	Buskin Lake	landlocked	20,000				
Monashka Creek	Buskin Lake	1,250	0		11,000	0	10,000
<b>Total Coho</b>	<b>Buskin Lake</b>	7,095	99,000	8,451	98,600	79,000	10,000
<b>Chinook:</b>							
Monashka Creek	Monashka Creek	350	0	46,000	109,000	0	47,000
American River	Monashka Creek		0	30,000	95,500	0	41,500
Olds River	Monashka Creek		0	30,000	95,500	0	41,500
Island Lake	Monashka Creek		150,000				
Abercrombie (Gertrude) Lake	Monashka Creek	landlocked	10,000				
<b>Total Chinook</b>	<b>Monashka Creek</b>	350	160,000	106,000	300,000	0	130,000

-continued-



Executive Summary, 2007.—Page 2 of 2.

Stocking Location	Broodstock	Projected Enhanced Return	2007 Stocking (brood year 2007)	2007 Stocking (brood year 2005)	2007 Egg take Goals <sup>e</sup>	2008 Stocking (brood year 2008)	2009 Stocking (brood year 2007)
<b>Rainbow Trout:</b>							
Abercrombie (Gertrude) Lake	Ft. Richardson/Swanson R.	landlocked	3,700		6,500	3,700	
Aurel Lake	Ft. Richardson/Swanson R.	landlocked	3,000		5,200	3,000	
Big (Lily) Lake	Ft. Richardson/Swanson R.	landlocked	3,600		6,300	3,600	
Bull Lake	Ft. Richardson/Swanson R.	landlocked	2,000		3,500	2,000	
Caroline Lake	Ft. Richardson/Swanson R.	landlocked	1,400		2,450	1,400	
Cicely Lake	Ft. Richardson/Swanson R.	landlocked	1,150		2,000	1,150	
Dolgoi Lake	Ft. Richardson/Swanson R.	landlocked	5,150		9,000	5,150	
Dragonfly Lake	Ft. Richardson/Swanson R.	landlocked	1,550		2,700	1,550	
Heitman Lake	Ft. Richardson/Swanson R.	landlocked	3,250		5,700	3,250	
Horseshoe Lake	Ft. Richardson/Swanson R.	landlocked	1,000		1,750	1,000	
Jack Lake	Ft. Richardson/Swanson R.	landlocked	1,000		1,750	1,000	
Jupiter Lake	Ft. Richardson/Swanson R.	landlocked	3,600		6,300	3,600	
Lee Lake	Ft. Richardson/Swanson R.	landlocked	2,800		4,900	2,800	
Lily Pond Lake	Ft. Richardson/Swanson R.	landlocked	1,600		2,800	1,600	
Long Lake	Ft. Richardson/Swanson R.	landlocked	3,600		6,300	3,600	
Margaret (Boy Scout) Lake	Ft. Richardson/Swanson R.	landlocked	1,600		2,800	1,600	
Saturn Lake	Ft. Richardson/Swanson R.	landlocked	2,400		4,200	2,400	
Tanignak Lake	Ft. Richardson/Swanson R.	landlocked	6,000		10,500	6,000	
Twin Lake	Ft. Richardson/Swanson R.	landlocked	4,000		7,000	4,000	
<b>Ft. Richardson</b>							
<b>Total Rainbow Trout</b>	<b>Hatchery/Swanson River</b>		52,400	0	91,650	52,400	0

<sup>a</sup> The projected enhanced run for Big Waterfall and Little Waterfall Lakes is a combined total estimate for the two systems.

<sup>b</sup> Afognak Lake sockeye salmon has traditionally been the primary broodstock for early-run stocking projects. Afognak Lake adult runs since 2001 have not been as strong as those of the 1990s, and in 2004, Malina Lake sockeye were utilized as an alternative early-run broodstock. Early-run sockeye egg takes were conducted at both Malina and Afognak Lakes in 2005. Afognak Lake was the sole brood source for the 2006 early-run sockeye egg take, and is the preferred brood source for 2007. Malina Lake sockeye may be utilized as a 2007 brood source if egg-take goals cannot be achieved using Afognak Lake brood exclusively.

<sup>c</sup> The projected return to Little Kitoi Lake of 3,700 late-run Saltery stock sockeye represents the portion of the 2007 run produced by Pillar Creek Hatchery (PCH) stocking of Little Kitoi Lake in 2004. The balance, and majority, of the run will be attributed to KBH stocking of Little Kitoi Lake, and the projection of those returns can be found in the Kitoi Bay Hatchery 2007 Annual Management Plan.

<sup>d</sup> Saltery stock sockeye eyed eggs are transferred to Kitoi Bay Hatchery; KBH incubates these eggs and rears resulting juveniles. Juveniles are released into Little Kitoi Lake.

<sup>e</sup> Rainbow trout eggs are taken from captive brood at ADF&G's Ft. Richardson Hatchery in Anchorage, and transferred to PCH as eyed eggs.



**Pillar Creek Hatchery (PCH) summary of active (in use)**  
**Fish Transport Permits (FTP)s: (page 1 of 5)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
<b>Egg takes, early-run sockeye</b>			
Afognak Lake egg take 99A-0051	7/15/1999	12/31/2008	Allows egg take of 4,100,000 green eggs at Afognak Lake; incubation and rearing at PCH, and release of the resultant fry into Hidden, Big and Little Waterfall, and Crescent Lakes.
Malina Lakes 04A-0042	4/1/2004	12/31/2009	Allows egg take of 4,100,000 green eggs at Malina Lake, to be incubated and reared at PCH; progeny to be released into Hidden, Crescent, Big Waterfall and Little Waterfall Lakes.
Little Waterfall Creek 04A-0054	7/15/2004	12/31/2009	Allows egg take of 4,100,000 green eggs at the Little Waterfall Lake, outlet creek, to be incubated and reared at PCH; progeny to be released into Hidden, Crescent, Big Waterfall and Little Waterfall Lakes. This is an alternate early-run brood source.
Laura Lake 99A-0060	7/15/1999	12/31/2008	Allows egg take of 1,500,000 green eggs at Laura Lake, incubation and rearing at PCH, and release of progeny into Laura Lake.
<b>Egg takes, late-run sockeye</b>			
Saltery Lake 97A-0071	8/31/1997	12/31/2008	Allows egg take of 9,800,000 green eggs at Saltery Lake, incubation and rearing at PCH, and release of progeny into Spiridon and Ruth Lakes.
Saltery Lake 97A-0068	9/1/1997	12/31/2008	Allows egg take of 1,200,000 green eggs at Saltery Lake, and transfer, incubation and rearing of up to 300,000 presmolt and 600,000 smolt at Kitoi Bay Hatchery.
Little Kitoi Lake 04A-0041	4/1/2004	12/31/2009	Allows egg take of 9,800,000 green eggs at Little Kitoi Lake, incubation and rearing at PCH, and release of progeny into Spiridon and Ruth Lakes.
<b>Stocking, early-run sockeye</b>			
Afognak Lake 04A-0055	8/1/2004	12/31/2009	Allows the release of up to 300,000 Afognak Lake stock fry, or 150,000 fingerling, or 75,000 presmolt, incubated and reared at PCH, into Afognak Lake.
Hidden Lake 99A-0053	7/15/1999	12/31/2008	Allows the release of up to 500,000 Afognak Lake stock fry, incubated and reared at PCH into Hidden Lake.
Hidden Lake 06A-0044	4/14/2006	12/31/2011	Allows the release of up to 500,000 Afognak Lake stock fingerling, incubated and reared at PCH into Hidden Lake.
Hidden Lake 99A-0054	7/15/1999	12/31/2008	Allows the release of up to 500,000 Afognak Lake stock presmolt, incubated and reared at PCH into Hidden Lake
Hidden Lake 04A-0035	4/1/2004	12/31/2009	Allows the release of up to 600,000 each Malina Lake stock fry and fingerling, and 500,000 presmolt, incubated and reared at PCH, into Hidden Lake.
Little Waterfall Lake 06A-0042	4/14/2006	12/31/2011	Allows the release of up to 400,000 Afognak Lake stock fry, incubated and reared at PCH into Little Waterfall Lake.

-continued-



**Pillar Creek Hatchery summary of active (in use)  
Fish Transport Permits (FTP): (page 2 of 5)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Little Waterfall Lake 06A-0045	4/17/2006	12/31/2011	Allows the release of up to 400,000 Afognak Lake stock fingerling, incubated and reared at PCH into Little Waterfall Lake.
Little Waterfall Lake 97A-0076	10/1/1997	12/31/2008	Allows the release of up to 200,000 Afognak Lake stock presmolt, incubated and reared at PCH into Little Waterfall Lake.
Little Waterfall Lake 04A-0038	4/1/2004	12/31/2009	Allows the release of up to 400,000 each Malina Lake stock fry and fingerling, and 350,000 presmolt, incubated and reared at PCH, into Little Waterfall Lake.
Big Waterfall Lake 06A-0046	4/14/2006	12/31/2011	Allows the release of up to 250,000 Afognak Lake stock fry, incubated and reared at PCH, into Big Waterfall Lake
Big Waterfall Lake 99A-0055	7/15/1999	12/31/2008	Allows the release of up to 250,000 Afognak Lake stock fingerling, incubated and reared at PCH, into Big Waterfall Lake
Big Waterfall Lake 04A-0032	4/1/2004	12/31/2009	Allows the release of up to 250,000 Afognak Lake stock presmolt, incubated and reared at PCH, into Big Waterfall Lake
Big Waterfall Lake 04A-0031	4/1/2004	12/31/2009	Allows the release of up to 250,000 each Malina Lake stock fry, fingerling and presmolt, incubated and reared at PCH, into Big Waterfall Lake.
Crescent Lake 06A-0047	4/17/2006	12/31/2011	Allows the release of up to 500,000 Afognak Lake stock fry, incubated and reared at PCH into Crescent Lake.
Crescent Lake 99A-0052	7/15/1999	12/31/2008	Allows the release of up to 500,000 Afognak Lake stock fingerling, incubated and reared at PCH into Crescent Lake.
Crescent Lake 04A-0034	4/1/2004	12/31/2009	Allows the release of up to 275,000 Afognak Lake stock presmolt, incubated and reared at PCH, into Crescent Lake.
Crescent Lake 04A-0033	4/1/2004	12/31/2009	Allows the release of up to 500,000 each Malina Lake stock fry and fingerling, and 275,000 presmolt, incubated and reared at PCH, into Crescent Lake.
Malina Lake 06A-0043	4/14/2006	12/31/2011	Allows the release of up to 500,000 Malina Lake stock fry, incubated and reared at PCH, into Malina Lake.
Malina Lake 99A-0056	7/15/1999	12/31/2008	Allows the release of up to 500,000 Malina Lake stock fingerling, incubated and reared at PCH, into Malina Lake.
Malina Lake 97A-0078	7/15/1999	12/31/2008	Allows the release of up to 300,000 Malina Lake stock presmolt, incubated and reared at PCH, into Malina Lake.
Laura Lake 99A-0062	7/15/1999	12/31/2008	Allows the release of up to 200,000 Laura Lake stock fingerling, incubated and reared at PCH, into Laura Lake.
Laura Lake 99A-0061	7/15/1999	12/31/2008	Allows the release of up to 200,000 Laura Lake stock presmolt, incubated and reared at PCH, into Laura Lake.

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**Pillar Creek Hatchery summary of active (in use)  
Fish Transport Permits (FTP)s: (page 3 of 5)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
<b>Stocking, late-run sockeye</b>			
Saltery Lake 04A-0056	8/1/2004	12/31/2009	Allows the release of up to 800,000 Saltery Lake stock fry, or 400,000 fingerling, or 200,000 presmolt, incubated and reared at PCH, into Saltery Lake.
Spiridon Lake 99A-0059	7/15/1999	12/31/2008	Allows the release of up to 7,000,000 Saltery Lake stock fingerling, incubated and reared at PCH into Spiridon Lake.
Spiridon Lake 04A-0040	4/4/2004	12/31/2009	Allows the release of up to 7,000,000 Saltery Lake stock fry, and 1,000,000 presmolt, incubated and reared at PCH, into Spiridon Lake.
Little Kitoi Lake 04A-0037	5/1/2004	12/31/2009	Allows the release of up to 100,000 Saltery Lake stock fingerling, and 150,000 presmolt, incubated and reared at PCH, into Ruth Lake.
Ruth Lake 99A-0058	7/15/1999	12/31/2008	Allows the release of up to 300,000 Saltery Lake stock fingerling, incubated and reared at PCH, into Ruth Lake.
Ruth Lake 04A-0039	5/1/2004	12/31/2009	Allows the release of up to 300,000 each Saltery Lake stock fry and presmolt, incubated and reared at PCH, into Ruth Lake.
Jennifer Lake 04A-0036	3/1/2004	12/31/2009	Allows the release of 400,000 and 250,000 Saltery Lake stock fry and presmolt, incubated and reared at PCH, into Jennifer Lake.
<b>Egg takes, coho</b>			
Buskin Lake 04A-0004	1/1/2004	12/31/2013	Allows egg take from 50 spawning pairs at Buskin Lake; incubation and rearing at PCH, and release of the resultant progeny into anadromous and landlocked systems in Chiniak Bay.
<b>Stocking, coho</b>			
Road System Lakes 04A-0006	1/1/2004	12/31/2013	Allows the release of Buskin Lake stock juveniles, incubated and reared at PCH, into Kodiak road system lakes, as follows: 22,500 into Island Lake (plus 27,500 smolt, amendment exp. 12/07) 7,500 into Dark Lake 12,500 into Mission Lake (plus 47,500 smolt, amendment exp. 12/07) 9,500 into Potato Patch Lake 6,500 into Mayflower Lake
Southern Lake 04A-0005	1/1/2004	12/31/2013	Allows the release of up to 3,500 Buskin Lake stock juveniles, incubated and reared at PCH, into Southern Lake.
Margaret Lake 04A-0013	1/1/2004	12/31/2013	Allows the release of up to 3,500 Buskin Lake stock juveniles, incubated and reared at PCH, into Margaret Lake.
Abercrombie Lake 05A-0003	1/1/2005	12/31/2013	Allows the release of up to 3,500 Buskin Lake stock juveniles, incubated and reared at PCH, into Abercrombie Lake.
Big (Lily) Lake 05A-0004	1/1/2005	12/31/2013	Allows the release of up to 10,000 Buskin Lake stock juveniles, incubated and reared at PCH, into Big (Lily) Lake.
Chiniak Lagoon 07A-0019	3/15/2007	7/1/2012	Allows the release of up to 20,000 Buskin Lake stock juveniles, incubated and reared at PCH, into Chiniak Lagoon.
Monashka Creek 04A-0007	1/1/2004	12/31/2008	Allows the release of up to 10,000 Buskin Lake stock smolt, incubated and reared at PCH, into Monashka Creek.

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**Pillar Creek Hatchery summary of active (in use)  
Fish Transport Permits (FTP)s: (page 4 of 5)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
<b>Egg takes, Chinook</b>			
Karluk River 00A-0010	2/6/2000	12/31/2008	Allows egg take of 300,000 green eggs at Karluk River; incubation and rearing at PCH, and release of the resultant presmolt into Monashka Creek.
Monashka 05A-0050	4/1/2005	9/1/2014	Allows egg take of 300,000 green eggs at Monashka Creek; incubation and rearing at PCH, and release of the resultant smolt into Monashka Creek. Eggtake may occur at Karluk River during transition from Karluk to Monashka broodstock.
<b>Stocking, Chinook</b>			
Monashka Creek			see above
Island Lake 04A-0011	1/1/2004	12/31/2007	Allows the release of up to 150,000 juvenile Chinook, incubated and reared at PCH, into Island Lake, IF an emergency occurs at PCH, and rearing salmon can not be held to smolt size.
Abercrombie Lake 04A-0012	1/1/2004	12/31/2007	Allows the release of up to 10,000 juvenile Chinook, incubated and reared at PCH, into Abercrombie Lake IF an emergency occurs at PCH, and rearing salmon can not be held to smolt size.
American River 07A-0017	5/1/2007	12/31/2011	Allows the release of Chinook smolt resulting from the Monashka Creek egg take, incubated and reared at PCH, into the American River. No limit is specified; releases are not expected to exceed 150,000 fish.
Olds River 07A-0020	5/1/2007	12/31/2011	Allows the release of Chinook smolt resulting from the Monashka Creek egg take, incubated and reared at PCH, into the American River. No limit is specified; releases are not expected to exceed 150,000 fish.
<b>Egg transfer, rainbow trout</b>			
Ft. Richardson transfer 07A-0029	3/20/2007	12/31/2012	Allows transfer of 92,000 eyed all-female 3N triploid eggs from ADF&G's Ft. Richardson Hatchery in Anchorage to PCH; incubation and rearing at PCH, and release of the resultant juveniles into Kodiak Road System Lakes.

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**Pillar Creek Hatchery summary of active (in use)  
Fish Transport Permits (FTP)s: (page 5 of 5)**

Project Name FTP Number	Issue Date	Expiration Date	Purpose
<b>Stocking, rainbow trout</b>			
Road System Lakes 07A-0018	1/26/2007	7/31/2012	<p>Allows the release of Ft. Richardson Hatchery stock juveniles (original donor stock; Swanson River), incubated and reared at PCH, into Kodiak road system lakes, as follows:</p> <p>3,700 into Abercrombie (Gertrude) Lake  3,000 into Aurel Lake  3,600 into Big (Lily) Lake  2,000 into Bull Lake  1,400 into Caroline Lake  1,150 into Cicely Lake  5,150 into Dolgoi Lake  1,550 into Dragonfly Lake  3,250 into Heitman Lake  1,000 into Horseshoe Lake  1,000 into Jack Lake  3,600 into Jupiter Lake  2,800 into Lee Lake  1,600 into Lily Pond Lake  3,600 into Long Lake  1,600 into Lupine Lake  1,600 into Margaret (Boy Scout) Lake  2,400 into Saturn Lake  6,000 into Tanignak Lake  4,000 into Twin Lake</p>







## ABSTRACT

Pillar Creek Hatchery (PCH) was constructed in 1990 as a cooperative project between the Alaska Department of Fish and Game (ADF&G) and the Kodiak Regional Aquaculture Association (KRAA). PCH incubates and rears single stocks of Chinook *Oncorhynchus tshawytscha* and coho *O. kisutch* salmon, and two stocks of sockeye salmon *O. nerka*. Beginning in 2007, PCH will also incubate and rear rainbow trout *O. mykiss*.

A total of 1,125,000 early-run juvenile sockeye salmon (Afognak Lake broodstock) will be released in 2007. Prior releases of the Afognak Lake early-run stock are expected to produce approximately 10,000 adult sockeye salmon returning in June 2007. About 1,494,000 early-run sockeye eggs will be collected in 2007 for incubation at PCH. After emergence and rearing at the hatchery, a total of 1,150,000 juveniles will be released in 2008.

Approximately 2,070,000 late-run juvenile sockeye salmon (Saltery Lake broodstock) will be released in 2007. The majority of these fish will be released into Spiridon Lake (1,750,000) with additional releases into Ruth, Jennifer, and Little Kitoi lakes. Prior juvenile releases are expected to produce 354,000 adult sockeye salmon returning to Spiridon Lake in late June through early August 2007. Approximately 5,824,000 Saltery Lake sockeye salmon eggs will be collected in 2007 for stocking Spiridon (3,550,000), Jennifer (275,000), and Ruth (50,000) lakes, and transferring 785,000 eyed eggs to Kitoi Bay Hatchery to hatch and eventually release 600,000 juvenile sockeye salmon into Little Kitoi Lake for the Spiridon Lake broodstock development program.

A total of 107,451 juvenile coho salmon (Buskin Lake broodstock) will be released in 2007. These releases include approximately 8,451 coho fingerlings brood year (BY) 2005 released into Island Lake. An additional 99,000 fingerlings and/or fall presmolt (BY 2006) will be released into ten road system lakes in 2007. Prior releases of this coho salmon stock are expected to produce a return of 7,095 adult coho salmon in late August and September 2007. The 2007 Buskin River coho salmon egg take goal will be to collect about 99,000 eggs for releasing juvenile coho salmon in 2008 and 2009.

Approximately 46,000 brood year 2005 Chinook salmon smolt will be released into Monashka Creek in 2007, and an additional 60,000 Chinook smolt into the American and Olds rivers (30,000 into each river). About 350 adult Chinook salmon are expected to return to Monashka Creek in 2007. Approximately 150,000 BY 2006 Chinook fingerling will be released into Island Lake, and 10,000 into Abercrombie Lake. Approximately 300,000 Chinook salmon eggs will be collected in 2007 for an eventual release of approximately 47,000 smolt into Monashka Creek, and 41,500 each into the American and Olds rivers in 2009.

Approximately 52,000 triploid rainbow trout fingerling will be stocked into 19 landlocked lakes on the Kodiak Road System in 2007. Approximately 92,000 rainbow trout eggs taken from captive broodstock at the ADF&G's Ft. Richardson Hatchery in Anchorage will be transferred to Pillar Creek Hatchery at the eyed stage to support this project.

Key words: Pillar Creek Hatchery, Kodiak Regional Aquaculture Association, sockeye salmon, coho salmon, Chinook salmon, egg take, broodstock, stocking, fry, fingerling, presmolt, smolt, harvest, return



## INTRODUCTION

Pillar Creek Hatchery (PCH) is located on the Kodiak road system about seven miles north of Kodiak City (Figures 1, 2, and 3). The hatchery was constructed in 1990 as a cooperative project between the Alaska Department of Fish and Game (ADF&G) and the Kodiak Regional Aquaculture Association (KRAA; Honnold and Byrne 2004; Honnold and Clevenger 2003; McCullough and Clevenger 2002). PCH has the capacity to incubate up to 20 million salmon eggs and rear 16 million juveniles to a variety of life stages (fry, fingerlings, presmolt, and smolt). The facility is operated primarily by funds provided by KRAA and, to a lesser extent, through a cooperative agreement with the ADF&G, Division of Sport Fish. PCH was originally designed to produce juvenile sockeye salmon *Oncorhynchus nerka* for: 1) stocking barren-lake systems to enhance adult production, and 2) stocking anadromous lakes to supplement wild sockeye salmon stocks in attempts to rehabilitate diminished runs (KRAA 1998). These stocking projects were developed to improve sockeye salmon harvest opportunities in the Kodiak Management Area (KMA) for commercial seine and gill net, subsistence, and recreational fishers.

Spiridon Lake was selected as the primary barren-lake sockeye salmon stocking project for PCH and has been stocked annually since 1991 (Figure 1). Malina and Laura lakes were the first anadromous lake stocking projects, which were initiated in 1992 and 1993 respectively, and discontinued in the late 1990s after successfully rebuilding both sockeye runs (Figure 1).

Late-run Upper Station sockeye salmon were initially used to stock Spiridon Lake and Little Kitoi Lake near the Kitoi Bay Hatchery (KBH; Figure 1). Little Kitoi Lake releases were intended to develop a brood source for the Spiridon Lake project (Honnold and Aro 2004). Investigations by ADF&G and the U.S. Fish and Wildlife Service (USFWS) indicated that the Sallery Lake stock would be preferred for Spiridon Lake stocking (Figure 1; Honnold 1997; Honnold et al. 1999). The earlier run timing of Sallery Lake sockeye salmon (about three weeks earlier than the late-run Upper Station sockeye stock) was expected to improve returns to Little Kitoi Lake and make broodstock collection easier. Additionally, the earlier run timing was expected to reduce the incidental harvest of Spiridon River pink *O. gorbuscha* and chum *O. keta* salmon stocks during the terminal fishery targeting sockeye salmon returns to Spiridon Lake.

Sallery Lake stock will continue to be the brood source for the Spiridon Lake project in 2007. Little Kitoi Lake has been stocked with Sallery Lake sockeye salmon stock from KBH annually since 1999 and this stocking will continue (Schrof and Aro 2006). Depending on the magnitude of the adult sockeye run, an egg take may occur at Little Kitoi Lake in 2007 for the first time since the brood source was changed. If the 2007 run is not sufficient to meet a substantial portion of the egg-take goals, broodstock from Sallery Lake will again be collected and used for stocking Spiridon, Jennifer, and Ruth lakes and continuing broodstock development at Little Kitoi Lake (Figure 1).

PCH also provides early-run juvenile sockeye salmon for stocking several barren lakes in the Kodiak area. Hidden, Crescent, Little Waterfall, and Big Waterfall lakes will be stocked with juvenile early-run sockeye salmon in 2007 (Figure 1). Afognak Lake sockeye salmon have traditionally been the primary broodstock for early-run stocking projects. However, Afognak Lake adult sockeye returns since 2001 have not been as strong as the runs of the 1990s. In 2004, Malina Lake sockeye salmon were utilized as an alternative early-run broodstock. Early-run sockeye egg takes were conducted at both Malina and Afognak lakes in 2005, with resultant



juveniles stocked in 2006. The 2006 escapement at Afognak Lake was sufficient to allow a full egg take. Afognak Lake is the preferred brood source for the early-run sockeye salmon stocking program. However, Malina Lake sockeye salmon will be an alternative brood source in 2007, if egg-take goals cannot be achieved using Afognak Lake brood exclusively.

Lake fertilization (1991-2001) and sockeye salmon stocking (1992-1999) projects were conducted at the Malina Lake system from 1991 to 2001 to restore adult production levels to adequately achieve escapement goals (Schrof and Honnold 2003; Figure 1). Juveniles (Malina Lake broodstock) were released back (“backstocked” – taking eggs from a system, hatching the eggs at the hatchery, and releasing the juveniles back into the same system) into the Malina system, which increased ensuing adult returns. Sockeye salmon escapement goals were achieved from 1999 through 2002 (Wadle 2004). Stocking was planned for the 2000 - 2002 seasons, but escapement levels were sufficient to forego egg takes. Planning for rehabilitation egg takes was discontinued after 2002 and the stock is now considered to be rehabilitated (McCullough and Clevenger 2002).

A similar restoration project was conducted at Laura Lake, which was also fertilized (1993-2001) and supplemented with sockeye fry (1994-1996 and 1999) of Laura Lake origin (Figure 1). In 1996, 1997, and 1999 through 2002 sockeye salmon eggs were not collected at Laura Lake due to adequate adult escapement. As a result of reaching escapement goals for four consecutive years, lake fertilization and egg takes were discontinued after 2002 and the stock was considered rehabilitated (McCullough and Clevenger 2002).

PCH will also raise coho salmon *O. kisutch* juveniles for stocking lakes along the Kodiak Island road system to enhance recreational sport fishing opportunities (KRAA 1998). Buskin Lake coho salmon were reared to the fry or fingerling life stages at PCH annually from 1992 to 2006 for road system stocking (Figure 2). The availability of additional rearing space for coho salmon since 2003 has allowed for the rearing and release of coho salmon presmolt and smolt into road system lakes, and Monashka Creek has been added as a smolt stocking location which can be utilized in years when the hatchery has adequate raceway space. Coho salmon smolt stocking is not planned for 2007, as it is precluded by the brood year (BY) 2005 juvenile Chinook *O. tshawytscha* inventory. Future releases of coho smolt will be dependent upon the number of Chinook salmon reared at PCH, and available rearing space. Buskin Lake coho salmon eggs are also used for several classroom incubation programs in Kodiak area schools.

A Chinook salmon enhancement project was initiated at PCH in 2000 after the sockeye and coho salmon programs were established (McCullough et al. 2000). A permit alteration request (PAR) was approved for the PCH Basic Management Plan in January 2000 (McCullough et al. 2000). The PAR provides for the development of a Chinook salmon enhancement project for the Kodiak road system to increase recreational fishing opportunities. Chinook salmon eggs were collected for the first time from the Karluk River in 2000. These eggs were incubated and reared at PCH and about 60,400 smolt were released into Monashka Creek in the spring of 2002 (Figure 2). This project was continued with egg takes occurring at Karluk River during 2001 to 2004, and the release of smolt from 2003 to 2005. In 2005, the first return of adult Chinook produced by this project allowed for an egg take at Monashka Creek. Currently, PCH is rearing 106,500 juvenile Chinook salmon (BY 2005) that are scheduled to be released into Monashka Creek and the American and Olds rivers (new in 2007) in 2007. Approximately 296,000 Chinook salmon fry resulting from the 2006 Monashka Creek egg take are being reared for release as fingerling in 2007 and as smolt in 2008. The Chinook salmon project will continue in 2007 with an egg take



goal of 170,000 eggs for an eventual release of 130,000 smolt in 2009. Monashka Creek is now the established brood source for the KRAA/ADF&G Cooperative Kodiak Road System Chinook Enhancement Project, and the 2007 egg take will utilize returns to Monashka Creek.

In 2007, a PAR was approved for the PCH Basic Management Plan, which will allow the hatchery to incubate and rear rainbow trout *O. mykiss*. Prior to 2007, ADF&G annually stocked juvenile all-female 3N triploid rainbow trout from the ADF&G Ft. Richardson Hatchery in Anchorage into 20 landlocked Kodiak Road System lakes for sport fish enhancement, continuing a rainbow trout stocking program that began in 1953. As of 2007, rainbow trout will be transferred as eyed eggs from Ft. Richardson Hatchery to PCH, and stocked following incubation and rearing at PCH. Stocking locations will remain consistent with the past locations. Approximately 92,000 brood year 2007 eyed eggs will be transferred to support the stocking of approximately 52,000 juvenile trout in 2007.

PCH will continue to adhere to all measures for protecting natural salmon stocks including genetics guidelines, policies and guidelines for health and disease control, and the prevention of straying. The prevention of strays may require implementing an unplanned cost recovery fishery in the event that enhanced returns of adults cannot be efficiently harvested.

The purpose of this report is to provide some historical background on PCH and serves as a resource document that summarizes the hatcheries stocking, rearing, and egg take into an annual management plan for sockeye, coho and Chinook salmon, and rainbow trout in 2007.

## **2007 SOCKEYE SALMON RELEASES**

Below we describe stock-specific sockeye salmon releases planned for 2007. Juvenile sockeye will be transported from Kodiak to specific lakes by either float-equipped aircraft which will release fish after landing on the lake, or by a wheel-equipped aircraft which will stock by aerial release.

### **EARLY-RUN SOCKEYE SALMON: AFOGNAK LAKE DONOR STOCK**

A total of approximately 1,125,000 early-run Afognak Lake stock juveniles will be released into four lakes (Hidden, Little Waterfall, Big Waterfall, and Crescent) in 2007 (Table 1; Figure 1; Appendix A1). About 575,000 fry will be released in May with the remaining 550,000 juveniles reared until October and released as presmolt. Fry releases will range from about 100,000 (Little Waterfall Lake) to 300,000 (Hidden Lake). Releases of presmolt will range from approximately 90,000 (Big Waterfall Lake) to 180,000 (Hidden Lake).

Adult returns from these releases are estimated to total about 64,735 fish (Tables 1 and 2). Approximately 6,522 “jacks” (age 1.1 fish) will return in 2009, with the remaining returns expected in 2010 (20,376 fish), 2011 (33,568 fish), and 2012 (4,269). The run timing of these returns should be similar to Afognak Lake sockeye salmon (brood source) escapement, with runs beginning in late May, peaking about mid June, and substantially declining by early July (Figure 4).

### **LATE-RUN SOCKEYE SALMON: SALTERY LAKE DONOR STOCK**

Spiridon Lake will be stocked with approximately 1,750,000 juvenile Saltery Lake sockeye salmon in 2007 (Table 3; Figure 1; Appendix A2). Of these, 1,500,000 will be released as fry in June and 250,000 as presmolt in October. Ruth Lake will be stocked with 50,000 fry and Jennifer Lake with 270,000 Saltery Lake fry in June 2007 (Table 3; Figure 1; Appendix A2).



We expect about 98,683 adult salmon to return as a result of the 2007 releases into Spiridon Lake (Tables 2 and 3). A small number of jacks (838) are estimated to return in 2009 and some older age fish (3,645) should return in 2012. However, the majority of adult returns should occur in 2010 (38,496) and 2011 (55,704). Ruth and Jennifer lake releases in 2007 are expected to produce 14,385 adults returning primarily in 2010 (4,580) and 2011 (8,957). Releases into Little Kitoi Lake are expected to produce approximately 3,700 adults in 2007 (Table 13). The run timing of returns from the stocking of Spiridon, Jennifer, and Ruth lakes should be similar to the escapement timing of Saltery Lake sockeye salmon, with the run beginning in mid June, peaking in early to mid July, and ending in mid to late August (Figure 5).

## **2007 COHO SALMON RELEASES**

### **BUSKIN LAKE DONOR STOCK**

PCH plans to release 8,451 coho salmon fingerling (BY 2005) into Island Lake in 2007 (Table 4; Figure 2; Appendix A3). An additional 99,000 coho salmon fingerlings (BY 2006) are scheduled for releases into Island, Dark, Mission, Potato Patch, Big (Lily), Mayflower, Southern, Margaret (Boy Scout), Abercrombie (Gertrude) lakes, and Chiniak Lagoon in August 2007 (Table 5; Figure 2; Appendix A3).

Coho salmon juveniles are transported from PCH in a truck-mounted transport tank to each stocking location with the exception of Southern Lake, which are transported by skiff.

Fingerling releases (BY 2005) in 2007 are expected to produce about 549 returning adults in 2008 (Tables 2 and 4). About 4,453 adults should return in 2008 from the 2007 releases of BY 2006 fingerling (Table 5). Estimates of adult returns will vary if fingerling releases are reduced in 2006 in lieu of smolt releases in 2007. The run timing should be similar to the escapement timing of Buskin Lake coho, with fish beginning to return in mid to late August, peaking in late September, and declining by mid October (Figure 6).

During the 2006/2007 school year, Kodiak Island Borough schools were provided 500 coho salmon eggs for educational programs. Eggs from the 2006 egg take were incubated in classroom incubators with resultant fry released by students into one of the several previously mentioned lakes.

## **2007 CHINOOK SALMON RELEASES**

### **MONASHKA CREEK DONOR STOCK**

In April 2007, approximately 47,000 Chinook salmon smolt will be transported in a truck-mounted fish transport tank from PCH to the stocking location at Monashka Creek (Table 6; Figure 2; Appendix A4). The smolt will be held for imprinting in a raceway adjacent to Monashka Creek until they are released in late May. Two new stocking locations, the American River and Olds River will each be stocked with approximately 30,000 BY 2005 Chinook smolt in May 2007. The smolt will be confined to instream pens during the imprinting period prior to a late May release. Approximately 160,000 BY 2006 Chinook fingerling will be released into Island (150,000) and Abercrombie (10,000) lakes in June 2007 (Table 6).

Approximately 1,292 adult Chinook salmon are expected to return from the 2007 releases with the majority (652) of the adults returning in 2011 (Table 6). The run timing of the road system Chinook salmon were expected to be similar to the donor stock (Karluk River Chinook salmon),



which returns in late May, peaking in mid June, and declining by early July (Figure 7). However, the Chinook salmon that returned to Monashka Creek in 2005 and 2006 were approximately two weeks later than the Chinook salmon returns to the Karluk River (L. Schwarz, Alaska Department of Fish and Game, Kodiak, personal communication).

## **2007 RAINBOW TROUT RELEASES**

### **FORT RICHARDSON HATCHERY CAPTIVE BROOD/SWANSON RIVER ORIGINAL DONOR STOCK**

In August-October 2007, approximately 52,000 all-female triploid rainbow trout fingerling raised at PCH will be stocked into nineteen landlocked lakes on the Kodiak Road System (Table 7; Figure 3). PCH will incubate and rear rainbow trout for the first time in 2007.

### **BROODSTOCK NUMBERS, ESCAPEMENT GOALS, AND EGG-TAKE GUIDELINES**

In 2007, we propose collecting the following broodstock for egg takes: 1,439 Afognak Lake early-run sockeye salmon (1,650 sockeye salmon, if Malina Lake is used as an alternate early-run broodstock), 3,820 Saltery Lake late-run sockeye salmon, 52 Buskin Lake coho salmon, and 120 Monashka Creek Chinook salmon (Table 8). Escapement goal ranges for these systems are 20,000-50,000 sockeye salmon at Afognak Lake, 1,000-10,000 sockeye salmon at Malina Lake (back up brood source to Afognak Lake, if necessary), 15,000-30,000 sockeye salmon at Saltery Lake, 3,200-7,200 coho salmon at Buskin River (Nelson et al. 2005). Monashka Creek does not have a Chinook salmon escapement goal.

The egg take guidelines established in 2005 (Honnold and Byrne 2005) will be used for 2007:

1. Egg takes will be prohibited when escapements are less than or equal to 50% of the lower bound of the escapement goal range for a given system (Table 8).
2. Broodstock removals will not reduce escapements below 50% of the lower bound of the escapement goal range for a given system (Table 8); broodstock removals will be reduced accordingly if necessary (Appendices B1-B3).
3. Broodstock removals for sockeye salmon egg takes may be contingent upon specific “replacement requirements” to compensate for the adults that were removed from the spawning population. Replacement requirement is defined as the number of juvenile sockeye salmon of the specific stock needed for “backstocking” into each system (Appendices B4-B6).
4. Replacement will be required when escapements are one fish over 50% of the lower bound of the escapement goal range and just under (one fish) the sum of the lower goal range and brood stock removal for a given system. For example, the lower bound of the escapement goal range for Afognak Lake is 20,000 sockeye salmon and we propose using 1,439 for broodstock. Thus,  $50\% \times 20,000 + 1 = 10,001$  and  $20,000 - 1 + 1,439 = 21,439$ , so replacement backstocking will be required if the escapement is from 10,001 to 21,439 sockeye salmon in 2007. If the escapement is less than or equal to 10,000 fish, the egg take will be prohibited.
5. Backstocking options will be based upon productivity parameters for each sockeye salmon system and are intended to replace potential lost production from adult removals (i.e., the



number of juveniles backstocked will produce the approximate number of adults that the spawners would have produced had they not been removed).

6. Specific backstocking options based on proposed broodstock removal in 2007 are outlined in Appendices B4-B6.
7. Backstocking of sockeye salmon presmolt is recommended to lessen lake grazing pressure and to provide for easy identification of returning adults (through unique scale patterns).
8. Replacement will be optional for coho broodstock removal due to the small numbers of adults needed for the coho egg take and the anticipation of the Buskin River coho escapement requirement being met (L. Schwarz, Alaska Department of Fish and Game, Kodiak, personal communication). If the Buskin River coho run is weak in 2007, replacement for broodstock removal may occur and, if needed, backstocking options will be developed. Monashka Creek, the Chinook salmon brood source, does not have a Chinook salmon escapement goal.

## **2007 SOCKEYE SALMON EGG TAKES (2008 STOCKING)**

Egg take goals for 2007 and stocking levels for 2008, as described below for each broodstock, are based on the evaluation of the zooplankton production in each lake. This evaluation was based on zooplankton data collected in 2006 and may be adjusted in season as a result of limnological analysis of zooplankton data collected at each lake in 2007. Rearing limitations at PCH (i.e., how many juveniles of each life stage can be successfully cultured) may also result in modifications to stocking levels in 2008.

### **EARLY-RUN SOCKEYE SALMON: AFOGNAK LAKE DONOR STOCK**

The 2007 early-run egg-take goal is 1,495,000 Afognak Lake sockeye salmon eggs (1,439 adults), which should provide for stocking about 1,150,000 juveniles in 2008 (Table 9; Appendix A1). These fish will be released into Hidden (300,000 fry and 200,000 presmolt), Little Waterfall (100,000 fry and 150,000 presmolt), Big Waterfall (100,000 presmolt), and Crescent (200,000 fry and 100,000 presmolt) lakes.

The escapement levels at Afognak Lake in 2007 will determine the number of broodstock available for an egg take (Table 9; Appendix B1). Malina Lake sockeye salmon may be used as an alternative broodstock for the aforementioned stocking projects if escapement levels preclude or do not allow the egg take goal to be met at Afognak Lake (Table 9; Appendices A1 and A5). The egg-take guidelines previously described will be adhered to regardless of the egg take location (Table 9; Appendices B1 and B2).

### **LATE-RUN SOCKEYE SALMON: SALTERY LAKE DONOR STOCK**

The 2007 late-run egg-take goal for PCH stocking projects is 5,039,000 (3,820 adults) Saltery Lake sockeye salmon eggs (Table 10; Appendix A2). In addition to the primary egg take goal for PCH, approximately 785,000 green eggs (595 adults) will be collected as part of the broodstock development program for Spiridon Lake (Schrof and Aro 2007). Eyed eggs (600,000) will be transferred from PCH to KBH until hatched and the juveniles will be released into Little Kitoi Lake for future adult returns to the system. The PCH 2008 stocking goal is 3,875,000 juveniles, of which 3,550,000 (3,300,000 fry and 250,000 presmolt) will be released into Spiridon Lake, 275,000 (all fry) into Jennifer Lakes, and 50,000 (all fry) into Ruth Lake.



The egg take at Saltery Lake will be based upon the level of escapement available for broodstock collection (Table 9; Appendix B3). There are no other “wild” late-run stocks available for alternate egg takes, if escapement levels preclude or do not allow the egg take goal to be met at Saltery Lake. Little Kitoi Lake sockeye salmon returns, as a result of broodstock development at Kitoi Bay Hatchery, may be available for broodstock collection; however, it is uncertain that egg-take goals can be reached at the level of escapement expected at Little Kitoi Lake in 2007 (Schrof and Aro 2007).

### **2007 COHO SALMON EGG TAKES (2008 STOCKING)**

Approximately 98,800 Buskin Lake coho salmon eggs (52 adults) will be collected in 2007, which will provide approximately 62,000 fingerlings to stock into six road system lakes in 2008 and 27,000 spring presmolt or smolt in 2009 for stocking into Kodiak Road System lakes and/or Monashka Creek (Table 11; Appendix A4).

We do not expect that Buskin River coho salmon escapement levels will preclude or reduce broodstock collection in 2007, due to the small number (52) of broodstock needed to attain egg take goals (Table 9; Appendix A4) and the anticipated magnitude of the 2007 coho salmon escapement (L. Schwarz, Alaska Department of Fish and Game, Kodiak, personal communication). However, alternate broodstocks for coho stocking projects have not been identified and adherence to egg take guidelines may result in reducing egg take goals or not collecting eggs in 2007. Replacement requirements have not been identified for the Buskin River coho salmon stock, but may be developed in 2007.

### **2007 CHINOOK SALMON EGG TAKES (2009 STOCKING)**

The 2007 Chinook salmon egg take goal is for 170,000 Monashka Creek eggs (60 adults), which is expected to provide for stocking of approximately 47,000 smolt into Monashka Creek, 41,500 smolt into the Olds River, and 41,500 smolt into the American River in 2009 (Table 12; Appendix A4). There is not an escapement goal for Chinook salmon into Monashka Creek, which should allow managers to acquire adequate broodstock to meet the hatchery egg-take goals. If egg-take goals are not met, 2008 stocking levels may be adjusted accordingly.

### **2007 RAINBOW TROUT EGG TAKES (2007 STOCKING)**

The 2007 Ft. Richardson Hatchery rainbow trout egg-take goal for Kodiak Road System stocking is 94,461 green eggs (122 adults). The eggs will be taken from captive broodstock on the Ft. Richardson Hatchery grounds in Anchorage. Approximately 81,200 eyed eggs will be transported via air freight to PCH in May 2007. Following incubation and rearing at PCH, the resulting juveniles will be stocked in August – October 2007.

## **SOCKEYE SALMON HARVEST AND MANAGEMENT**

A total of 371,800 sockeye salmon produced from PCH stocking projects are expected to return in 2007 (Table 13). The majority of these fish (354,000) will be a result of Spiridon Lake stocking. Hidden, Little Waterfall, Big Waterfall, Crescent, Spiridon, Little Kitoi, and Ruth lakes are systems without native salmon runs. Salmon may be present in the lake outlet streams from marine waters to the salmon barrier. All sockeye salmon returning to these systems will be available for harvest. Prior to 2005, terminal harvest areas (THA) were designated to manage the



harvest of enhanced sockeye salmon production from PCH in an orderly fashion (Honnold and Byrne 2004). Special Harvest Areas (SHA) replaced THAs to allow for cost recovery of the enhanced harvest in the unlikely event that the commercial salmon fishery was not taking place to harvest the run (5 AAC 40.085).

### **HARVEST OF RETURNS TO HIDDEN LAKE**

The Foul Bay (Hidden Lake; Figure 8) harvest strategy is designed to allow for the harvest of sockeye salmon produced from the Hidden Lake enhancement project and to provide for the protection of wild salmon stocks returning to, or passing through, the Northwest Afognak Section of the Afognak District (Figure 9). The run timing of Hidden Lake returns should be similar to the timing of Afognak Lake sockeye salmon (brood source) escapement, with runs beginning in late May, peaking in early June, and declining substantially by early July (Figure 4).

Hidden Lake sockeye salmon runs will be harvested in the Foul Bay SHA, which includes the area of Foul Bay east of 152°47.20' W long. (Figure 8; 5 AAC 40.085(3)). By regulation the only legal gear type for the SHA is seine gear. Because a harvestable surplus of enhanced sockeye salmon is expected in the SHA, continuous fishing periods through the duration of the sockeye run will be allowed by the ADF&G, beginning 5 June (Wadle 2007). The fishery directed at the Hidden Lake sockeye salmon run is not expected to impact pink salmon escapement because the fishery occurs prior to the arrival of most of the pink salmon. There is no escapement requirement for sockeye salmon in Hidden Creek as the lake is inaccessible due to a large barrier falls. The sockeye salmon harvest is expected to occur primarily in the Foul Bay SHA; however, some Hidden Lake sockeye salmon may be harvested in the Northwest Afognak Section (Figure 9).

The ADF&G recognizes that some incidental harvest of wild stocks could occur in the Foul Bay SHA while the fishery is managed to harvest the Hidden Lake sockeye salmon run. The ADF&G may adjust the size of the SHA to minimize the harvest of wild stocks and to target the Hidden Lake sockeye salmon. Age and scale pattern analysis of the commercial harvest have indicated a minimal wild stock bycatch (Schrof et al. 2000; Schrof and Honnold 2003). Therefore, a reduction in the size of the SHA is not expected in 2007 (J. Wadle, Alaska Department of Fish and Game, Kodiak, personal communication).

### **HARVEST OF RETURNS TO CRESCENT LAKE**

The purpose of the Crescent Lake stocking project is to provide additional sockeye salmon for harvest in the Settler Cove (Crescent Lake) area without compromising wild stock escapements, primarily Barabara Lake sockeye salmon (Figure 10). The run timing of Crescent Lake returns should be similar to the escapement timing of Afognak Lake sockeye salmon (brood source), with runs beginning in late May, peaking in early June, and declining substantially by early July (Figure 4).

The harvest of Crescent Lake sockeye salmon is expected to occur during fishing periods targeting early-run sockeye, pink, and chum salmon in the Central Section of the Northwest Kodiak District (Figure 9). During 2007 the fishery will open in the Central Section of the Northwest Kodiak District on 5 June for a 57-hour period (Wadle 2007). Additional fishing time is dependent on the run strength of early-run Karluk Lake sockeye salmon (5 AAC 18.362). The Settler Cove SHA, which includes all waters of Settler Cove west of 152°50.80' W long. (Figure 10; 5 AAC 40.085(5)), could open in 2007, if large numbers of sockeye salmon are not harvested during normal commercial fishery openings and are observed in the Settler Cove area.



All fish in the SHA will be available for harvest; residents of Port Lions will utilize the inriver escapement for subsistence purposes.

### **HARVEST OF RETURNS TO LITTLE AND BIG WATERFALL LAKES**

The Waterfall Bay harvest strategy allows for the harvest of enhanced sockeye salmon returning to Waterfall Bay and provides safeguards for wild salmon escapements (Figure 11). The run timing of returns to Waterfall Bay should be similar to the escapement timing of Afognak Lake sockeye salmon (brood source), with runs beginning in late May, peaking in early June, and declining substantially by early July (Figure 4).

The sockeye salmon harvest is expected to occur in the Waterfall Bay SHA within the Perenosa Bay Section (Figure 11). The Waterfall Bay SHA includes waters seaward of the stream terminus of Little (251-822) and Big (251-821) Waterfall creeks to a straight line extending northwesterly from 58°24.15' N lat., 152°28.23' W long. to 58°25.60' N lat., 152°28.23' W long. (5 AAC 40.085(4)). By regulation, the only legal gear type for the Waterfall Bay SHA is seine gear. Since escapement and broodstock are not required, all returning enhanced sockeye salmon will be available for harvest. Because a harvestable surplus of enhanced sockeye salmon is expected in 2007, continuous fishing through the duration of the sockeye run will be allowed beginning 5 June (Wadle 2007).

A fish barrier will not be used in the terminus of Big Waterfall Creek; all returning adults that are not harvested will have unimpeded access to freshwater downstream of the barrier falls.

### **HARVEST OF RETURNS TO SPIRIDON LAKE**

The Spiridon Lake sockeye salmon management plan, 5 AAC 18.366, is designed to allow for the harvest of enhanced sockeye salmon returning to Spiridon Lake (Wadle 2007; Figure 12) and to provide adequate protection for escapements of wild salmon stocks returning to streams in the area (Spiridon River sockeye, pink, chum, and coho salmon; stream number 254-401). The intent of this stocking project is to provide enhanced sockeye salmon in traditional commercial fishing areas in the Northwest (NW) Kodiak District (Figure 9). The sockeye salmon run as a result of Spiridon Lake stocking in 2007 is expected to begin in late June and continue into mid-August (Figure 5).

Harvests of Spiridon Lake sockeye salmon are expected to occur during openings targeting Karluk Lake sockeye and westside pink and chum salmon stocks (Wadle 2007). A SHA, however, is required to provide for an orderly harvest of enhanced sockeye salmon that have migrated past the traditional commercial fishing areas of the Northwest Kodiak District. The Spiridon Bay SHA includes all waters of Telrod Cove north of a line extending from Stream Point at 57° 39.00' N lat., 153° 38.50' W long., to a point at 57° 38.80' N lat., 153° 37.70' W long. (5 AAC 40.085(2); Figure 12). A continuous fishing period will be announced by the ADF&G when enhanced sockeye salmon are documented within the SHA (Wadle 2007). By regulation, the only legal gear type for the Spiridon Bay SHA is seine gear. A series of barrier falls prevents salmon from entering Spiridon Lake, but sockeye salmon returning to Telrod Cove have access to Telrod Creek (Figure 12). Closed water markers ensure that intertidal habitat is not disturbed during fishing operations.

The ADF&G recognizes that some incidental harvest of wild stocks could occur in this area while the fishery is managed to harvest the enhanced Spiridon Lake sockeye salmon. The restricted size of the SHA coupled with the run timing (Saltery Lake sockeye salmon broodstock)



of returns to Spiridon Lake, however, are expected to reduce the incidental harvest of wild salmon stocks, specifically those returning to Spiridon River (pink and chum salmon) and Telrod Creek (pink salmon).

The SHA will be monitored by ADF&G personnel beginning in mid June and continuing until early August or when the SHA is closed to fishing.

## **HARVEST OF RETURNS TO RUTH AND LITTLE KITOI LAKES**

The combined return of PCH-stocked enhanced sockeye salmon to Ruth and Little Kitoi Lakes is projected to be 7,700 in 2007 (Table 13). Additional returning sockeye will be attributed to Kitoi Bay Hatchery stocking of Little Kitoi Lake. KBH has been stocking Little Kitoi Lake with Sallery stock late-run sockeye salmon annually since 1999 with only minor supplemental stocking by PCH, prior to 2004. The enhanced sockeye salmon returning to these systems will be harvested incidentally in 2007 during pink, chum, and coho salmon fisheries in the Kitoi, Izhut, and Duck Bay sections of the Afognak District (Figures 1 and 9; Wadle 2007; Schrof and Aro 2007). The run timing is expected to be similar to that described for Spiridon Lake runs, since Sallery Lake sockeye salmon were used as broodstock (Figure 5).

## **HARVEST REPORTING**

Spiridon Lake SHA, Foul Bay SHA, Waterfall Bay SHA, and Kitoi Bay Area (Ruth and Little Kitoi Lakes) salmon harvest information will be monitored through daily verbal processor reports and the ADF&G fish ticket database. On-site estimates of harvest and the collection of age and sex composition data from returning sockeye salmon will be collected by field personnel at each of these locations.

Harvest information from the Crescent Lake sockeye salmon run will be monitored through the ADF&G fish ticket database and subsistence permit reports. The harvest contribution from this project will be determined by assigning all sockeye salmon harvested in the Settler Cove SHA as originating from Crescent Lake. The run timing and location of the fishery (SHA) provides for an isolated harvest of returning adults. The subsistence harvest will be assigned through the ADF&G subsistence use reporting system.

# **ADDITIONAL MEASURES FOR WILDSTOCK PROTECTION**

## **GENETICS POLICY**

The ADF&G Genetics Policy is designed to ensure that stocking projects do not negatively impact the genetic integrity of wild stocks (McGee 1995). The policy addresses three primary areas: 1) stock transport, 2) protection of wild stocks, and 3) maintenance of genetic variance. This policy, as described in the 1998 Pillar Creek Hatchery Annual Management Plan (Honnold et al. 1998), will be followed in 2007 for all projects.

To protect wild stocks and maintain their genetic integrity, adults produced from hatchery stocking projects must be prevented from straying into stream and lake systems supporting wild stocks. A management strategy targeting the enhanced production is required by ADF&G to ensure compliance with state regulations for private nonprofit (PNP) salmon hatcheries (5 AAC 40.005(f)). This strategy must address ADF&G PNP permitting requirements for salmon straying concerns and include detailed actions required when harvest of enhanced production is delayed or abandoned.



These actions were detailed in an UCROP as part of the 2003 PCH annual management plan, and included as cost recovery fisheries in the THAs (currently SHAs; Honnold and Clevenger 2003). If commercial fishing does not occur for some reason in 2007, salmon returning to the SHAs will be harvested using the guidelines described in the UCROP.

## **POLICIES AND GUIDELINES FOR HEALTH AND DISEASE CONTROL**

The State of Alaska Pathology Review Committee has developed a long range goal to prevent dissemination of infectious finfish (and shellfish) disease within or outside the borders of Alaska (McGee 1995). This goal is intended to protect stocks without constraining aquaculture or stock renewal programs. The policy and guidelines are to prevent the transplanting of wild finfish stocks between geographic zones to minimize the risk of transporting disease from one zone to another. This policy includes hatchery stocks in order to be consistent with the Genetics policy. Some exceptions may be made on a case by case basis. The policy and guidelines for health and disease control, as described in the 1998 Pillar Creek Hatchery AMP (Honnold et al. 1998), will be followed in 2007 for all projects.

## **SPECIAL STUDIES/RESEARCH**

The 1994 to 1997 Spiridon Lake sockeye salmon runs were reconstructed using scale pattern analysis to identify Spiridon Lake fish in the Northwest Kodiak District or in the Southwest Afognak Section commercial harvests (Nelson and Barrett 1994; Nelson and Swanton 1996; Nelson and Swanton 1997; Nelson 1999). The runs from 1998 to 2006, however, have not been formally reconstructed due to the run timing differences between the original late-run Upper Station broodstock (stocked from 1991 to 1994 and 1996 to 1997) and the Saltery Lake broodstock (stocked in 1995 and from 1998 to the present). Stock separation techniques used when only the late-run Upper Station stock fish returned (1994 to 1997) were not appropriate for application to the mixed stock runs (1998 to 2002) or for future runs when only the Saltery Lake fish return (P. Nelson, Alaska Department of Fish and Game, Kodiak, personal communication). This is primarily due to the increased number of both local and non-local stocks present in the Northwest Kodiak District when Spiridon Lake bound sockeye salmon are migrating through.

The average proportion of the Spiridon-bound sockeye salmon harvested in the Spiridon Lake THA from 1994 to 1997 (41%) was applied to the 1998 through 2006 THA harvest to reconstruct the recent Spiridon Lake sockeye salmon contribution to the harvests in the SW Afognak Section and Northwest Kodiak District (Schrof and Honnold 2003; Honnold and Byrne 2004). This method of run reconstruction will be used for the 2007 and future Spiridon Lake sockeye salmon runs until a new method of stock separation is developed and implemented to identify the Saltery Lake stock returns (S. Honnold, Alaska Department of Fish and Game, Kodiak, personal communication).

Smolt abundance will be estimated and samples collected for age and condition during their emigration from Spiridon Lake as a check on stocking density and to assist with run forecasts (Foster et al. 2006).

Smolt will also be sampled for condition and age at all other systems stocked with juvenile sockeye salmon. Stocked lakes will also be sampled to evaluate zooplankton trends and water quality parameters.



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## REFERENCE CITED

- Foster, M. B., S. Duesterloh, S. Thomsen, R. T. Baer, G. Watchers, and S. Schrof. 2006. Salmon research operational plans for the Kodiak area, 2006. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K06-4, Kodiak.
- Honnold, S. G. 1997. The results of sockeye salmon (*Oncorhynchus nerka*) stocking into Spiridon Lake on the Kodiak National Wildlife Refuge: juvenile and adult production, commercial harvest, and ecosystem effects, 1987-1996. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K97-47, Kodiak.
- Honnold, S. G., and C. Clevenger. 2003. Pillar Creek Hatchery annual management plan, 2003. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K03-38, Kodiak.
- Honnold, S. G., and D. Aro. 2004. Kitoi Bay Hatchery annual management plan, 2004. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K04-29, Kodiak.
- Honnold, S. G., and G. Byrne. 2004. Pillar Creek Hatchery annual management plan, 2004. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K04-40, Kodiak.
- Honnold, S. G., and G. Byrne. 2005. Pillar Creek Hatchery annual management plan, 2005. Alaska Department of Fish and Game, Fishery Management Report No. 05-45, Anchorage. <http://www.sf.adfg.state.ak.us/FedAidPDFs/fds05-45.pdf>
- Honnold S. G., C. Clevenger, and J. N. McCullough. 1998. Pillar Creek Hatchery annual management plan, 1998. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K98-24, Kodiak.
- Honnold, S. G., C. Clevenger, J. N. McCullough and S. T. Schrof. 1999. Pillar Creek Hatchery annual management plan, 1999. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K99-45, Kodiak.
- KRAA (Kodiak Regional Aquaculture Association). 1998. Pillar Creek Hatchery basic management plan. Alaska Department of Fish and Game, Private Nonprofit Salmon Hatchery Permit No. 41, Juneau.
- McGee, S. G. 1995. The hatchery program and protection of wild salmon in Alaska: policies and regulations. Alaska Department of Fish and Game, Division of Commercial Fisheries, Draft Report (compilation), Juneau.
- McCullough, J. N., C. Clevenger, S. G. Honnold, and S. T. Schrof. 2000. Pillar Creek Hatchery annual management plan, 2000. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K00-39, Kodiak.
- McCullough, J. N., and C. Clevenger. 2002. Pillar Creek Hatchery annual management plan, 2002. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K02-38, Kodiak.
- Nelson, P. A. 1999. An estimate of Spiridon Lake sockeye salmon commercially harvested within the Southwest Afognak Section and the Northwest Kodiak Districts, 1997. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K99-25, Kodiak.
- Nelson, P. A., and B. M. Barrett. 1994. An estimate of the number of Spiridon Lake sockeye salmon commercially harvested within the Northwest Kodiak and Southwest Kodiak Districts, 1994. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K94-43, Kodiak.
- Nelson, P. A., and C. O. Swanton. 1996. An estimate of the number of Spiridon Lake sockeye salmon commercially harvested within the Northwest Kodiak and Southwest Kodiak Districts, 1995. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K96-32, Kodiak.



## REFERENCES CITED (Continued)

- Nelson, P. A., and C. O. Swanton. 1997. An estimate of the number of Spiridon Lake sockeye salmon commercially harvested within the Northwest Kodiak and Southwest Kodiak Districts, 1996. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K97-44, Kodiak.
- Nelson, P. A., M. J. Witteveen, S. G. Honnold, I. Vining, and J. J. Hasbrouck. 2005. Review of salmon escapement goals in the Kodiak Management Area. Alaska Department of Fish and Game, Fishery Manuscript No. 05-05, Anchorage. <http://www.sf.adfg.state.ak.us/FedAidPDFs/fms05-05.pdf>
- Schrof, S., and A. Aro. 2006. Kitoi Bay Hatchery annual management plan, 2006. Alaska Department of Fish and Game, Division of Commercial Fisheries, Fishery Management Report No. 06-49, Anchorage. <http://www.sf.adfg.state.ak.us/FedAidPDFs/fmr06-49.pdf>
- Schrof, S., and A. Aro. 2007. Kitoi Bay Hatchery annual management plan, 2007. Alaska Department of Fish and Game, Division of Commercial Fisheries, Fishery Management Report No. 07-39, Anchorage. <http://www.sf.adfg.state.ak.us/FedAidPDFs/fmr07-39.pdf>
- Schrof S. T., and S. G. Honnold. 2003. A summary of salmon enhancement, rehabilitation, evaluation, and monitoring efforts conducted in the Kodiak Management Area through 2001. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K03-41, Kodiak.
- Schrof, S. T., S. G. Honnold, C. Hicks, and J. Wadle. 2000. A summary of salmon enhancement, rehabilitation, evaluation, and monitoring efforts conducted in the Kodiak Management Area through 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K00-57, Kodiak.
- Wadle, J. A. 2004. Kodiak Management Area commercial salmon annual management report, 2002. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K04-1, Kodiak.
- Wadle, J. 2007. Kodiak management area harvest strategy for the 2007 commercial salmon fishery. Alaska Department of Fish and Game, Division of Commercial Fisheries, Fishery Management Report 07-34, Anchorage. <http://www.sf.adfg.state.ak.us/FedAidPDFs/fmr07-34.pdf>



## **TABLES AND FIGURES**



**Table 1.**–Pillar Creek Hatchery early-run sockeye salmon egg takes (Afognak Lake broodstock) in 2006, resultant juvenile releases planned in 2007, projected adult production, and Fish Transport Permit (FTP) information.

<b>Fish Species</b>	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Totals
<b><u>Egg take</u></b>								
<b>eggs</b>	443,626	266,176	147,875	207,026	133,088	258,782	207,026	1,663,598
<b>adults</b>	385	231	128	180	116	225	180	1,445
<b><u>Releases</u></b>								
<b>location</b>	Hidden Lake	Hidden Lake	Little Waterfall Lake	Little Waterfall Lake	Big Waterfall Lake	Crescent Lake	Crescent Lake	
<b>number</b>	300,000	180,000	100,000	140,000	90,000	175,000	140,000	1,125,000
<b>size (g)</b>	0.4	10.5	0.3	10.5	10.5	0.3	10.5	
<b>lifestage</b>	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	
<b>date</b>	26-May-07	05-Oct-07	16-May-07	05-Oct-07	05-Oct-07	16-May-07	05-Oct-07	
<b><u>Projected Returns</u></b> <sup>a</sup>								
<b>2009</b>	986	2,034	329	1,582	1,017	575	1,582	6,522
<b>2010</b>	3,551	5,958	1,184	4,634	2,979	2,071	4,634	20,376
<b>2011</b>	6,305	9,432	2,102	7,336	4,716	3,678	7,336	33,568
<b>2012</b>	2,228	0	743	0	0	1,299	0	4,269
<b>total</b>	13,068	17,424	4,356	13,552	8,712	7,623	13,552	64,735
<b><u>Fish Transport Permit (FTP)</u></b> <sup>b</sup>								
<b>number</b>	99A-0053	99A-0054	06A-0042	97A-0076	04A-0032	06A-0047	04A-0034	
<b>expires</b>	31-Dec-08	31-Dec-08	31-Dec-11	31-Dec-08	31-Dec-09	31-Dec-11	31-Dec-09	
<b>max. no.</b>	500,000	500,000	400,000	200,000	250,000	500,000	275,000	
<b>lifestage</b>	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	

<sup>a</sup> Projected returns are calculated from Table 2 survival and age assumptions.

<sup>b</sup> Fish Transport Permit 99A-0051 - for 4.1 million green eggs, expiring 31 Dec-08, authorizes egg take for these projects.



**Table 2.**—Salmon survival and age assumptions used to estimate returns for Pillar Creek Hatchery stocking projects.

Species	Broodstock <sup>a</sup>	Stocking		Survival <sup>b</sup>	Age-at-return Proportions <sup>b</sup>							
		Life Stage <sup>c</sup>	Size (g)		1.1	1.2	2.1	1.3	2.2	1.4	2.3	1.5
Sockeye	AL/ML	F	0.4	4.5%	0.07	0.22	0.04	0.36	0.11		0.17	
Sockeye	AL/ML	FG	1.0-3.0	6.5%	0.07	0.22	0.04	0.36	0.11		0.17	
Sockeye	AL/ML	PS	8.0-15.0	10.0%	0.11	0.33		0.52				
Sockeye	SL	F	0.4-0.6	4.5%	0.01	0.31	0.01	0.39	0.24		0.05	
Sockeye	SL	FG	3.0-6.0	6.5%	0.01	0.31	0.01	0.39	0.24		0.05	
Sockeye	SL	PS	8.0-13.0	12.5%	0.02	0.55		0.44				
Coho	BL	FG	3.0-5.0	6.5%			1.00					
Coho	BL	PS	8.0	10.0%	1.00							
Coho	BL	S	15.0	12.5%	1.00							
Chinook	MC	S	20.0	1.2%	0.02	0.12		0.32		0.50		0.03
Chinook	MC	FG	1.5	0.01%	0.02	0.12		0.32		0.50		0.03

<sup>a</sup> AL=Afognak Lake early run, ML=Malina Lake early run, SL=Saltery Lake late run, BL=Buskin Lake, and MC=Monashka Creek.

<sup>b</sup> based on actual survival and age-at-return data from Pillar Creek Hatchery and/or other ADF&G research projects.

<sup>c</sup> F=fry, FG=fingerling, PS=presmolt, and S=smolt.



**Table 3.**–Pillar Creek Hatchery late-run sockeye salmon egg takes (Saltery Lake broodstock) in 2006, resultant juvenile releases planned for 2007, projected adult production, and Fish Transport Permit information.

<b>Fish Species</b>	Late-run Sockeye	Late-run Sockeye	Late-run Sockeye	Late-run Sockeye	Late-run Sockeye	Totals
<b><u>Egg take</u></b>						
eggs	2,673,669	445,611	89,122	356,489	124,771	3,689,663 <sup>a</sup>
adults	2,145	357	71	286	100	2,960
<b><u>Releases</u></b>						
location	Spiridon Lake	Spiridon Lake	Ruth Lake	Upper Jennifer Lake	Lower Jennifer Lake	
number	1,500,000	250,000	50,000	200,000	70,000	2,070,000
size (g)	0.3	10.0	0.3	0.3	0.3	
lifestage	Fry	Presmolt	Fry	Fry	Fry	
date	07-Jun-07	05-Oct-07	07-Jun-07	07-Jun-07	07-Jun-07	
<b><u>Projected Returns</u></b> <sup>b</sup>						
2009	338	500	11	45	16	910
2010	21,465	17,031	716	2,862	1,002	43,075
2011	41,985	13,719	1,400	5,598	1,959	64,661
2012	3,645	0	122	486	170	4,423
total	67,433	31,250	2,248	8,991	3,147	113,068
<b><u>Fish Transport Permit (FTP)</u></b> <sup>c</sup>						
number	04A-0040	04A-0040	04A-0039	04A-0036	04A-0036	
expires	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	
max. no.	7,000,000	1,000,000	300,000	400,000	400,000	
lifestage	Fry	Presmolt	Fry	Fry	Fry	

<sup>a</sup> An additional 719,543 eggs were taken, and 577 adult brood utilized, for Kitoi Bay Hatchery late-run sockeye production. Eggs are transferred at the eyed egg stage of development.

<sup>b</sup> Projected returns are calculated from Table 2 survival and age assumptions.

<sup>c</sup> Fish Transport Permit 97A-0071 - for 9.8 million green eggs, expiring 31 Dec-08, authorizes egg take for these projects.



**Table 4.**–Pillar Creek Hatchery coho salmon egg take (Buskin Lake broodstock) in 2005, resultant juvenile releases planned for Road System Lakes in 2007, projected adult production, and Fish Transport Permit information.

<b>Fish Species</b>	<b>Coho</b>	<b>Totals</b>
<b><u>Egg take</u></b>		
eggs	20,029	20,029
adults	7	7
<b><u>Releases</u></b>	Island	
location	Lake	
number	8,451	8,451
size (g)	5.1	
lifestage	Fingerling	
date	23-Mar-07	
<b><u>Projected Returns</u></b>	<sup>a</sup>	
2008	549	549
total	549	549
<b><u>Fish Transport Permit (FTP)</u></b>	<sup>b</sup>	
number	04A-0006	
expires	31-Dec-13	
max. no.	22,500	
lifestage	any	

<sup>a</sup> Projected returns are calculated from Table 2 survival and age assumptions.

<sup>b</sup> Fish Transport Permit 04A-0004 - for 200,000 green eggs, expiring 31 Dec-13, authorized eggtake for these projects.



**Table 5.**–Pillar Creek Hatchery coho salmon egg takes (Buskin Lake broodstock) in 2006, resultant juvenile releases planned for Road System Lakes in 2007 and 2008, projected adult production, and Fish Transport Permit information.

<b>Fish Species</b>	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Totals
<b><u>Egg take</u></b>												
<b>eggs</b>	26,023	8,674	14,457	10,987	11,566	7,518	4,048	4,048	4,048	23,131	0	114,500
<b>adults</b>	14	5	8	6	6	4	2	2	2	12	0	60
<b><u>Releases</u></b>	Island	Dark	Mission	P.Patch	Big (Lily)	Mayflower	Southern	Margaret	Abercrombie	Chiniak	Monashka	
<b>location</b>	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lagoon	Creek <sup>a</sup>	
<b>number</b>	22,500	7,500	12,500	9,500	10,000	6,500	3,500	3,500	3,500	20,000	0	99,000
<b>size (g)</b>	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	15.0	
<b>lifestage</b>	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Smolt	
<b>date</b>	10-Aug-07	10-Aug-07	10-Aug-07	10-Aug-07	10-Aug-07	10-Aug-07	10-Aug-07	10-Aug-07	10-Aug-07	10-Aug-07	03-Jun-08	
<b><u>Projected Returns</u></b> <sup>b</sup>												
<b>2009</b>	1,463	488	813	618	650	423	0	0	0	0	0	4,453
<b>2010</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>total</b>	1,463	488	813	618	650	423	landlocked	landlocked	landlocked	landlocked	0	4,453
<b><u>Fish Transport Permit (FTP)</u></b> <sup>c</sup>												
<b>number</b>	04A-0006	04A-0006	04A-0006	04A-0006	05A-0004	04A-0006	04A-0005	04A-0013	05A-0003	07A-0019	04A-0007	
<b>expires</b>	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	01-Jul-12	31-Dec-08	
<b>max. no.</b>	22,500	7,500	12,500	9,500	10,000	6,500	3,500	3,500	3,500	20,000	10,000	
<b>lifestage</b>	any	any	any	any	any	any	any	any	any	any	smolt	

<sup>a</sup> Coho may be reared to, and released as, spring smolt depending upon hatchery Chinook salmon smolt inventory. Possible 2008 releases are not included in total releases for all locations.

<sup>b</sup> Projected returns are calculated from Table 2 survival and age assumptions. If smolt are released in 2007, they would return in 2008 (age 1.1 fish).

<sup>c</sup> Fish Transport Permit 04A-0004 - for 200,000 green eggs, expiring 31 Dec-13, authorized egg take for these projects.



**Table 6.**—Pillar Creek Hatchery Chinook salmon egg takes (Monashka Creek broodstock) conducted in 2005 and 2006, resultant juvenile releases planned in 2007, projected adult production, and Fish Transport Permit information.

<b>Fish Species</b>	Chinook	Chinook	Chinook	Chinook	Chinook	Totals
<b>Egg take</b>	BY2005	BY2005	BY2005	BY2006	BY2006	
<b>eggs</b>	58,806	58,806	91,150	174,874	11,658	395,294
<b>adults</b>	26	26	40	62	4	158
<b>Releases</b>	American	Olds	Monashka	Island	Abercrombie	
<b>location</b>	River	River	Creek	Lake	Lake	
<b>number</b>	30,000	30,000	46,500	150,000	10,000	266,500
<b>size (g)</b>	12.0	12.0	12.0	1.5	1.5	
<b>lifestage</b>	Smolt	Smolt	Smolt	fingerling	fingerling	
<b>date</b>	31-May-07	31-May-07	31-May-07	20-Jun-07	20-Jun-07	
<b>Projected Returns</b>	<sup>a</sup>					
<b>2008</b>	8	8	13	0	0	29
<b>2009</b>	43	43	67	2		154
<b>2010</b>	115	115	178	5		413
<b>2011</b>	182	182	281	8		652
<b>2012</b>	12	12	19	1		44
<b>total</b>	360	360	558	15	landlocked	1,292
<b>Fish Transport Permit (FTP)</b>	<sup>b</sup>					
<b>number</b>	07A-0017	05A-0004	05A-0050	04A-0011	04A-0012	
<b>expires</b>	31-Dec-11	31-Dec-11	01-Sep-14	31-Dec-07	31-Dec-07	
<b>max. no.</b>	none	none	none	150,000	10,000	
<b>lifestage</b>	smolt	smolt	smolt	any	any	

<sup>a</sup> Projected returns are calculated from Table 2 survival and age assumptions.

<sup>b</sup> Fish Transport Permit 05A-0050 allowed the egg take of 300,000 green eggs for these projects, the permit expires 01-Sep-14.



**Table 7.**–Pillar Creek Hatchery rainbow trout (RBT) egg take in 2007, resultant juvenile releases planned for Road System Lakes in 2007, and Fish Transport Permit information.

<b>Fish Species</b>	<b>RBT</b>	<b>RBT</b>	<b>RBT</b>	<b>RBT</b>	<b>RBT</b>	<b>RBT</b>	<b>RBT</b>	<b>RBT</b>	<b>RBT</b>	<b>RBT</b>	<b>Totals</b>
<b><u>Egg take</u></b>											
<b>eggs</b>	6,472	5,248	6,297	3,499	2,449	2,012	9,009	2,711	5,685	1,749	45,131
<b>adults</b>	8	7	8	4	3	3	12	3	7	2	58
<b><u>Releases</u></b>	Abercrombie	Aurel	Big (Lily)	Bull	Caroline	Cicely	Dolgoi	Dragonfly	Heitman	Horseshoe	
<b>location</b>	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	
<b>number</b>	3,700	3,000	3,600	2,000	1,400	1,150	5,150	1,550	3,250	1,000	25,800
<b>size (g)</b>	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
<b>lifestage</b>	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Smolt	
<b>date</b>	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	
<b><u>Egg take</u></b>											
<b>eggs</b>	1,749	6,297	4,898	2,799	6,297	2,799	4,198	10,496	6,997		49,330
<b>adults</b>	2	8	6	4	8	4	5	13	9		64
<b><u>Releases</u></b>	Jack	Jupiter	Lee	Lily Pond	Long	Margaret	Saturn	Tanignak	Twin		
<b>location</b>	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake	Lake		
<b>number</b>	1,000	3,600	2,800	1,600	3,600	1,600	2,400	6,000	4,000		26,600
<b>size (g)</b>	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
<b>lifestage</b>	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Smolt		
<b>date</b>	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07	10-Sep-07		52,400
<b><u>Projected Returns</u></b> No returns; all stocked lakes are landlocked.											
<b>Fish Transport</b>							<b>Maximum</b>				
<b><u>Permit (FTP)</u></b>	<b><u>Summary</u></b>						<b>Number</b>	<b>Expiration</b>			
07A-0029	Allows transfer of eyed eggs from Ft. Richardson Hatchery to PCH						92,000	31-Dec-12			
07A-0018	Allows release of juveniles into Kodiak Road System Lakes						57,300	31-Jul-12			



**Table 8.**—Donor stock, broodstock numbers, escapement goal range, egg take guidelines, and egg take replacement criteria for 2007 egg takes.

Species	Donor Stock	Broodstock Numbers	Escapement Goal Range	Egg take Guidelines - Escapement		Egg take Replacement Criteria	
				<b>Egg take Prohibited</b> Escapement is $\leq$ :	<b>Full Egg take Allowed</b> Escapement is $>$ : <sup>a</sup>	Replacement Required Escapement is: <sup>b</sup>	Replacement Requirement <sup>c</sup>
Sockeye	Malina Lake	1,650	1,000-10,000	500	2,150	501-3,149	43,250 presmolt
Sockeye	Afognak Lake	1,439	20,000-50,000	10,000	11,439	10,001 - 21,899	38,250 presmolt
Sockeye	Saltery Lake <sup>d</sup>	3,820	15,000-30,000	7,500	11,320	7,501 - 20,599	152,750 presmolt
Coho	Buskin Lake	52	3,200-7,200	1,600	1,652	none	none
Chinook	Monashka Creek	120	no escapement goal	n/a	n/a	none	none

<sup>a</sup> Full egg take refers to removal of proposed broodstock numbers. If escapements are less than this guideline, then broodstock removals will be reduced (Appendices B-C) to maintain escapements at or above 50% of the lower bound of the escapement goal range.

<sup>b</sup> 50% of lower bound of escapement goal range plus one (lower number) to the lower bound of escapement goal range minus one plus broodstock numbers (upper number). For example, Afognak Lake's lower number is  $50\% \times 20,000 + 1 = 10,001$  and the upper number is  $20,000 - 1 + 1,900 = 21,899$ .

<sup>c</sup> Refers to the number of juvenile fish necessary to replace lost production from the removal of adults used for broodstock.

<sup>d</sup> Broodstock numbers include approximately 600 adults for Kitoi Bay Hatchery projects (Schrof and Aro 2007).



**Table 9.**—Proposed Pillar Creek Hatchery early-run sockeye salmon egg takes (Afognak Lake and/or Malina Lake broodstock) in 2007, juvenile releases in 2008, projected adult production, and Fish Transport Permit information.

<b>Fish Species</b>	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Early-run Sockeye	Totals
<b><u>Egg take</u></b> <sup>a</sup>								
eggs	390,000	260,000	130,000	195,000	130,000	260,000	130,000	1,495,000
adults	375	250	125	188	125	250	125	1,439
<b><u>Releases</u></b>								
location	Hidden Lake	Hidden Lake	Little Waterfall Lake	Little Waterfall Lake	Big Waterfall Lake	Crescent Lake	Crescent Lake	
number	300,000	200,000	100,000	150,000	100,000	200,000	100,000	1,150,000
size (g)	0.4	10.0	0.4	10.0	10.0	0.4	10.0	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	
date	15-May-08	05-Oct-08	15-May-08	05-Oct-08	05-Oct-08	15-May-08	05-Oct-08	
<b><u>Projected Returns</u></b> <sup>b</sup>								
2010	986	2,260	329	1,695	1,130	657	1,130	7,201
2011	3,551	6,620	1,184	4,965	3,310	2,367	3,310	21,756
2012	6,305	10,480	2,102	7,860	5,240	4,203	5,240	35,125
2013	2,228	0	743	0	0	1,485	0	2,228
total	13,068	19,360	4,356	14,520	9,680	8,712	9,680	66,308
<b><u>FTP (Afognak Lake stock)</u></b> <sup>c</sup>								
number	99A-0053	99A-0054	06A-0042	97A-0076	04A-0032	06A-0047	04A-0034	
expires	31-Dec-08	31-Dec-08	31-Dec-11	31-Dec-08	31-Dec-09	31-Dec-11	31-Dec-09	
max. no.	500,000	500,000	400,000	200,000	250,000	500,000	275,000	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	
<b><u>FTP (Malina Lake stock)</u></b> <sup>c</sup>								
number	04A-0035	04A-0035	04A-0038	04A-0038	04A-0031	04A-0033	04A-0033	
expires	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	31-Dec-09	
max. no.	600,000	500,000	400,000	350,000	250,000	500,000	275,000	
lifestage	Fry	Presmolt	Fry	Presmolt	Presmolt	Fry	Presmolt	

<sup>a</sup> Afognak Lake sockeye salmon has traditionally been the primary broodstock for early-run stocking projects. Afognak Lake adult runs since 2001 have not been as strong as those of the 1990s. In 2004, Malina Lake sockeye salmon were established as an alternative early-run broodstock. Afognak Lake is still considered the primary brood source and Malina Lakes will be used as a secondary brood source, if sockeye salmon escapements to the Afognak Lake system are below the established goals in 2007.

<sup>b</sup> Projected returns are calculated from Table 2 survival and age assumptions.

<sup>c</sup> Fish Transport Permit 99A-0051 - for 4.1 million green eggs, expiring 31 Dec-08, authorizes Afognak Lake egg take for these projects. Malina Lake egg take is provided for under Fish Transport Permit 04A-0042, for 4.1 million eggs, expiring 31 Dec-09.



**Table 10.**—Proposed Pillar Creek Hatchery late-run sockeye salmon egg takes (Saltery Lake broodstock) in 2007, juvenile releases for Spiridon, Jennifer, and Ruth Lakes in 2008, projected adult production, and Fish Transport Permit information.

<b>Fish Species</b>	Late-run Sockeye	Late-run Sockeye	Totals	Late-run Sockeye	Late-run Sockeye	Totals	Late-run Sockeye	Late-run Sockeye	Totals	Late-run Totals
<b><u>Egg take</u></b>										
<b>eggs</b>	4,291,277	325,097	4,616,374	357,606	0	357,606	65,019	0	65,019	5,039,000
<b>adults</b> <sup>a</sup>	3,253	246	3,500	271	0	271	49	0	49	3,820
<b><u>Releases</u></b>	Spiridon	Spiridon	Spiridon	Jennifer	Jennifer	Jennifer	Ruth	Ruth	Ruth	
<b>location</b>	Lake	Lake	Lake	Lakes	Lakes	Lakes	Lake	Lake	Lake	
<b>number</b>	3,300,000	250,000	3,550,000	275,000	0	275,000	50,000	0	50,000	3,875,000
<b>size (g)</b>	0.4	10.0		0.4	10.0		0.4	10.0		
<b>lifestage</b>	Fry	Presmolt		Fry	Presmolt		Fry	Presmolt		
<b>date</b>	15-Jun-08	05-Oct-08		15-Jun-08	05-Oct-08		15-Jun-08	05-Oct-08		
<b><u>Projected Returns</u></b> <sup>b</sup>										
<b>2010</b>	743	500	1,243	62	0	62	11	0	11	1,316
<b>2011</b>	47,223	17,031	64,254	3,935	0	3,935	716	0	716	68,905
<b>2012</b>	92,367	13,719	106,086	7,697	0	7,697	1,400	0	1,400	115,183
<b>2013</b>	8,019	0	8,019	668	0	668	122	0	122	8,809
<b>total</b>	148,352	31,250	179,602	12,363	0	12,363	2,248	0	2,248	194,212
<b><u>Fish Transport Permit (FTP)</u></b> <sup>c</sup>										
<b>number</b>	04A-0040	04A-0040		04A-0036	04A-0036		04A-0039	04A-0039		
<b>expires</b>	31-Dec-09	31-Dec-09		31-Dec-09	31-Dec-09		31-Dec-09	31-Dec-09		
<b>max. no.</b>	7,000,000	1,000,000		400,000	250,000		300,000	300,000		
<b>lifestage</b>	Fry	Presmolt		Fry	Presmolt		Fry	Presmolt		

<sup>a</sup> Totals adults being utilized does not include approximately 600 additional fish collected for Kitoi Bay Hatchery projects.

<sup>b</sup> Projected returns are calculated from Table 2 survival and age assumptions.

<sup>c</sup> Fish Transport Permit 99A-0071 - for 9.8 million green eggs, expiring 31 Dec-08, authorizes egg take for these projects.



**Table 11.**—Proposed Pillar Creek Hatchery coho salmon egg takes (Buskin Lake broodstock) in 2007, resultant juvenile releases planned for Road System Lakes in 2008 (Monashka Creek in 2009), projected adult production, and Fish Transport Permit information.

<b>Fish Species</b>	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Coho	Totals
<b>Egg take</b>											
<b>eggs</b>	24,978	8,326	13,876	10,546	7,216	3,885	11,101	3,885	3,885	11,101 <sup>a</sup>	98,800
<b>adults</b>	13	4	7	6	4	2	6	2	2	6 <sup>a</sup>	52
<b>Releases</b>	Island	Dark	Mission	Potato	Mayflower	Southern	Big	Margaret	Abercrombie	Monashka	
<b>location</b>	Lake	Lake	Lake	Patch Lake	Lake	Lake	(Lily) Lake	Lake	Lake	Creek <sup>a</sup>	
<b>number</b>	22,500	7,500	12,500	9,500	6,500	3,500	10,000	3,500	3,500	10,000	89,000
<b>size (g)</b>	3.0	3.0	3.0	3.0	3.0	3.0	12.0	12.0	12.0	15.0	
<b>lifestage</b>	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Fingerling	Presmolt	Presmolt	Presmolt	Smolt	
<b>date</b>	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Jul-08	15-Mar-09	15-Mar-09	15-Mar-09	03-Jun-09	
<b>Projected Returns</b> <sup>b</sup>											
<b>2009</b>	0	0	0	0	0	0	0	0	0	0	0
<b>2010</b>	1,463	488	813	618	423	0	1,000	0	0	1,250	6,053
<b>total</b>	1,463	488	813	618	423	landlocked	1,000	landlocked	landlocked	1,250	6,053
<b>Fish Transport Permit (FTP)</b> <sup>c</sup>											
<b>number</b>	04A-0006	04A-0006	04A-0006	04A-0006	04A-0006	04A-0005	05A-0004	04A-0013	05A-0003	04A-0007	
<b>expires</b>	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-13	31-Dec-08	
<b>max. no.</b>	22,500	7,500	12,500	9,500	6,500	3,500	10,000	3,500	3,500	10,000	
<b>lifestage</b>	any	any	any	any	any	any	any	any	any	smolt	

<sup>a</sup> Coho may be reared to spring smolt and then released at Island Lk., Mission Lk., landlocked lakes, and/or Monashka Creek depending upon Chinook salmon smolt production. Possible 2008 releases are not included in column above of total releases for all locations.

<sup>b</sup> Projected returns are calculated from Table 2 survival and age assumptions.

<sup>c</sup> Fish Transport Permit 04A-0004 - for 200,000 green eggs, expiring 31 Dec-13, authorized egg take for these projects.



**Table 12.**–Proposed Pillar Creek Hatchery Chinook salmon brood used in the 2006 egg take (Monashka Creek broodstock) and the proposed adults needed for the 2007 egg take, resultant juvenile releases planned in 2008 and 2009, projected adult production, and Fish Transport Permit information.

<b>Fish Species</b>	Chinook	Chinook	Chinook	Chinook	Chinook	Chinook	Totals
<b><u>Egg take</u></b>	BY2006	BY2006	BY2006	BY2007	BY2007	BY2007	
<b>eggs</b>	51,259	51,259	58,052	54,269	54,269	61,462	330,570
<b>adults</b>	18	18	21	19	19	22	117
<b><u>Releases</u></b>	American	Olds	Monashka	American	Olds	Monashka	
<b>location</b>	River	River	Creek	River	River	Creek	
<b>number</b>	41,500	41,500	47,000	41,500	41,500	47,000	260,000
<b>size (g)</b>	20	20	20	20	20	20	
<b>lifestage</b>	Smolt	Smolt	Smolt	Smolt	Smolt	Smolt	
<b>date</b>	31-May-08	31-May-08	31-May-08	31-May-09	31-May-09	31-May-09	
<b><u>Projected Returns</u></b> <sup>a</sup>							
<b>2009</b>	11	11	13	11	11	13	70
<b>2010</b>	59	59	67	59	59	67	372
<b>2011</b>	159	159	180	159	159	180	996
<b>2012</b>	251	251	284	251	251	284	1,573
<b>2013</b>	17	17	19	17	17	19	106
<b>total</b>	498	498	564	498	498	564	3,118
<b><u>Fish Transport Permit (FTP)</u></b> <sup>b</sup>							
<b>number</b>	07A-0017	05A-0004	05A-0050	07A-0017	05A-0004	05A-0050	
<b>expires</b>	31-Dec-11	31-Dec-11	01-Sep-14	31-Dec-11	31-Dec-11	01-Sep-14	
<b>max. no.</b>	none	none	none	none	none	none	
<b>lifestage</b>	smolt	smolt	smolt	smolt	smolt	smolt	

<sup>a</sup> Projected returns are calculated from Table 2 survival and age assumptions.

<sup>b</sup> Fish Transport Permit 05A-0050 - for 300,000 green eggs, expiring 1 Sep-14, authorized the egg take for these stocking projects.



**Table 13.**—Estimated 2007 sockeye salmon runs as a result of Pillar Creek Hatchery stocking projects.

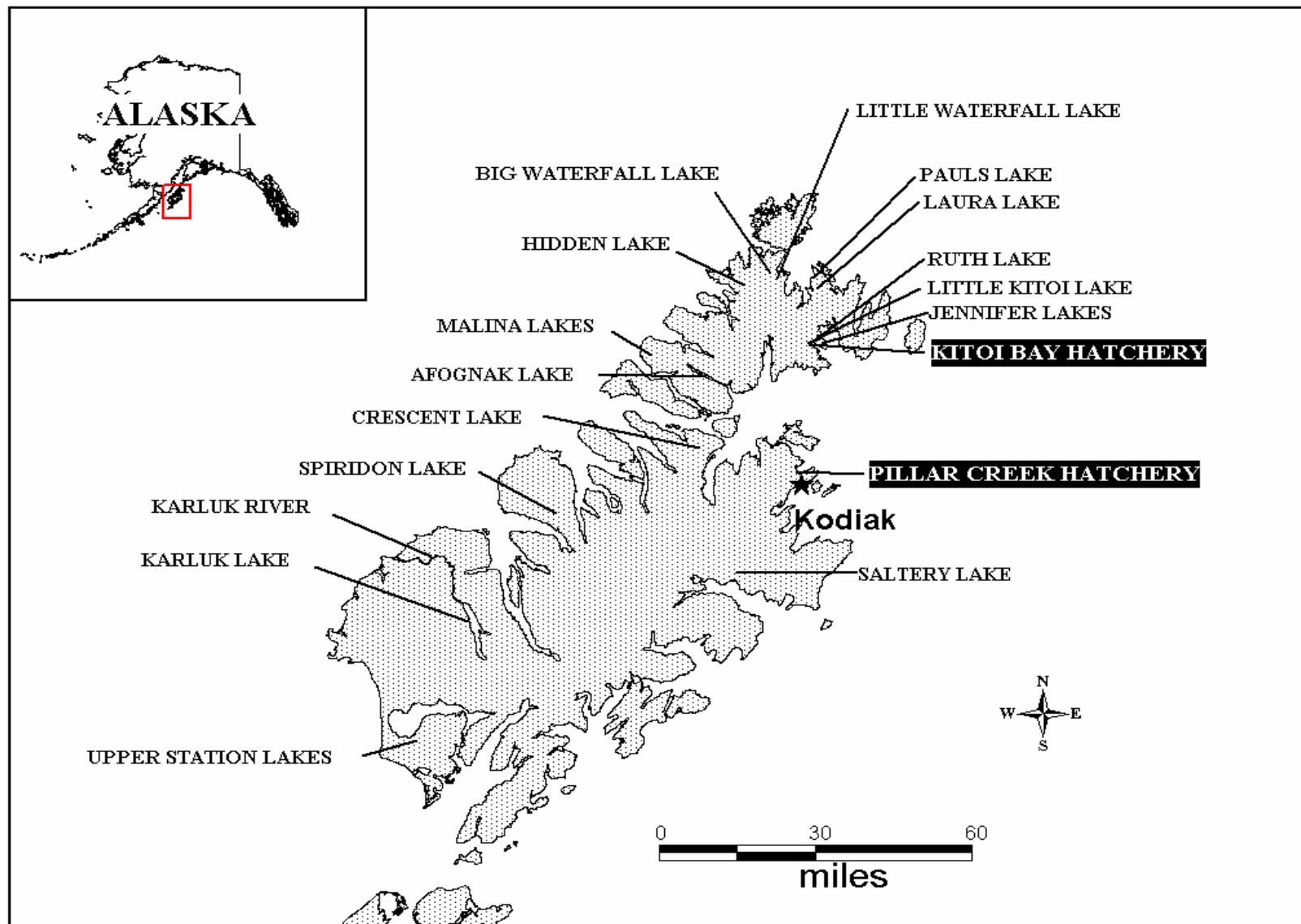
Lake Stocked	Broodstock <sup>a</sup>	Harvest Location	Forecasted Run	
			Point	Range
Hidden	Afognak Lake (ER)	Foul Bay SHA	5,089	2,467 - 6,399
Big & Little Waterfall	Afognak Lake (ER)	Waterfall Bay SHA	4,126	2,687 - 5,480
Crescent	Afognak Lake (ER)	Settler Cove SHA <sup>b</sup>	838	587 - 1,649
Spiridon	Saltery Lake (LR)	Spiridon Bay SHA <sup>c</sup>	354,000	215,000 - 492,000
Ruth Lake	Saltery Lake (LR)	Izhut and Ruth Bays	3,981	3,302 - 4,351
Little Kitoi Lake	Saltery Lake (LR)	Izhut and Kitoi Bays	3,723	3,100 - 4,439
Total Early Run:			10,053	5,154 - 13,528
Total Late Run:			361,704	221,402 - 500,790
Total Both Runs:			371,757	226,556 - 514,318

<sup>a</sup> ER = early-run; LR = late-run

<sup>b</sup> Some fish may be harvested in the Central Section of the Northwest Kodiak District.

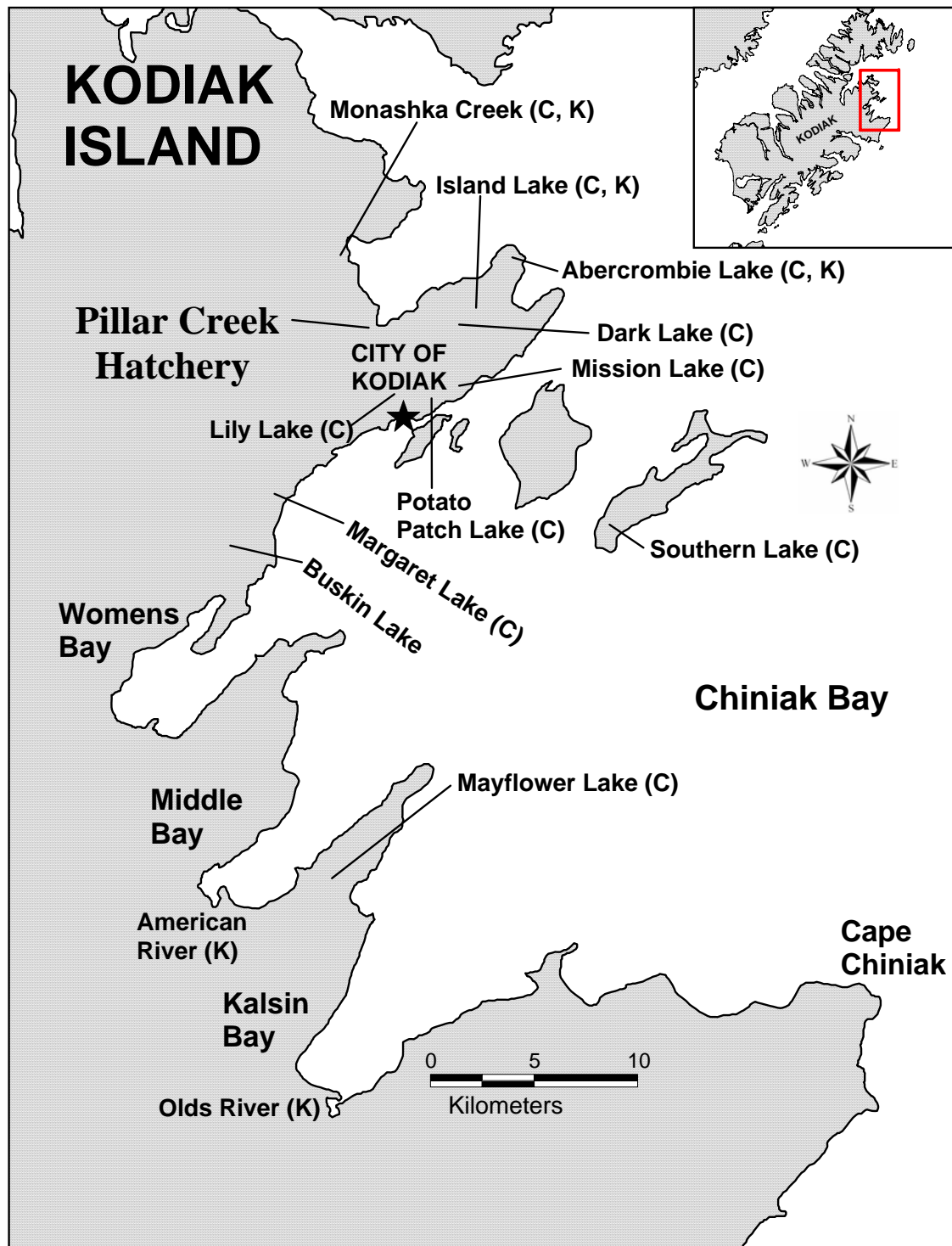
<sup>c</sup> Fish will also be harvested in traditional commercial fishing areas in the Northwest Kodiak District.





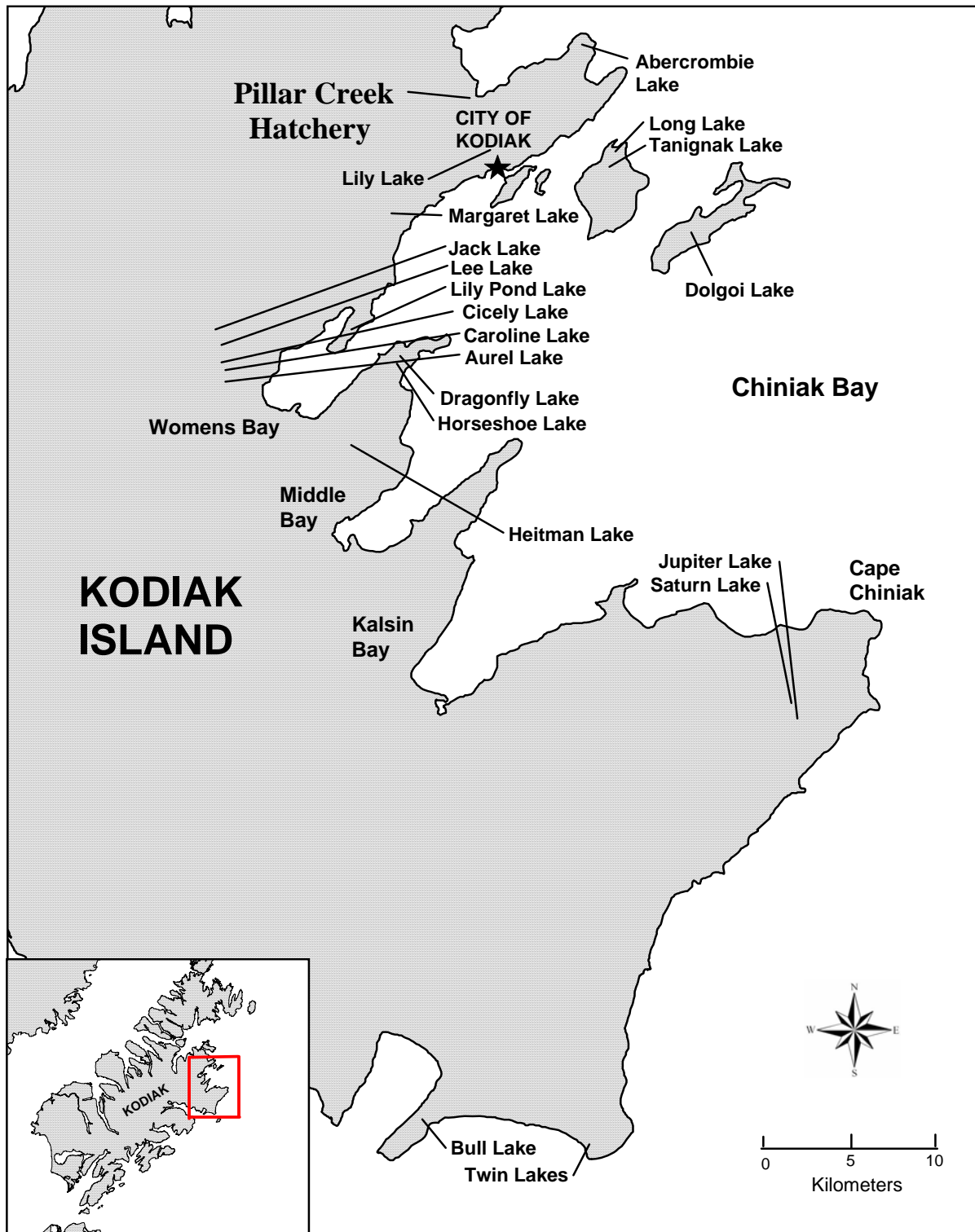
**Figure 1.**—Locations of past and present sockeye salmon enhancement and rehabilitation projects, and current egg take sites on Kodiak and Afognak Islands.





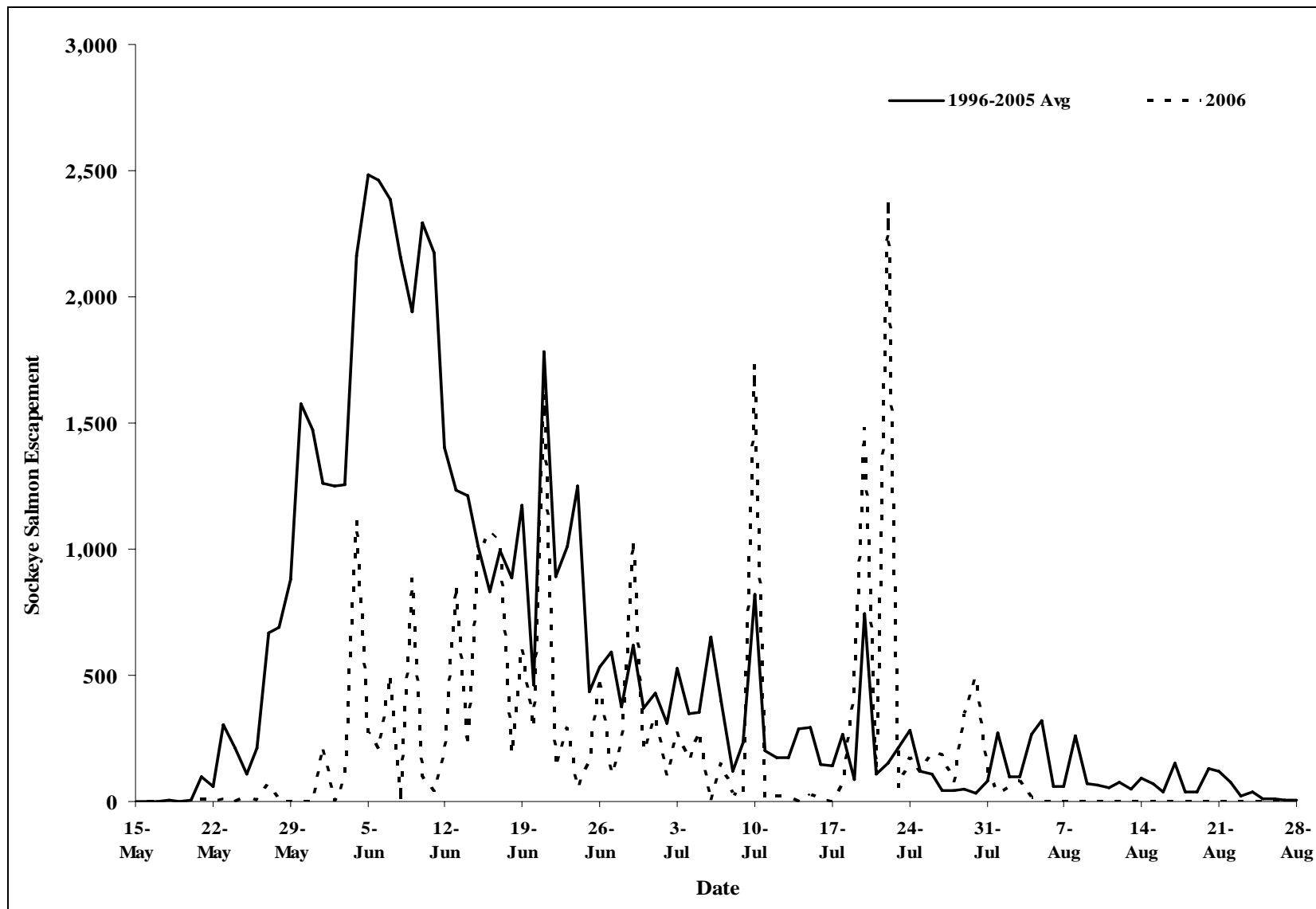
**Figure 2.**—Locations of Kodiak Island road system lakes and rivers that are to be stocked with coho (C) and Chinook (K) salmon in 2007.





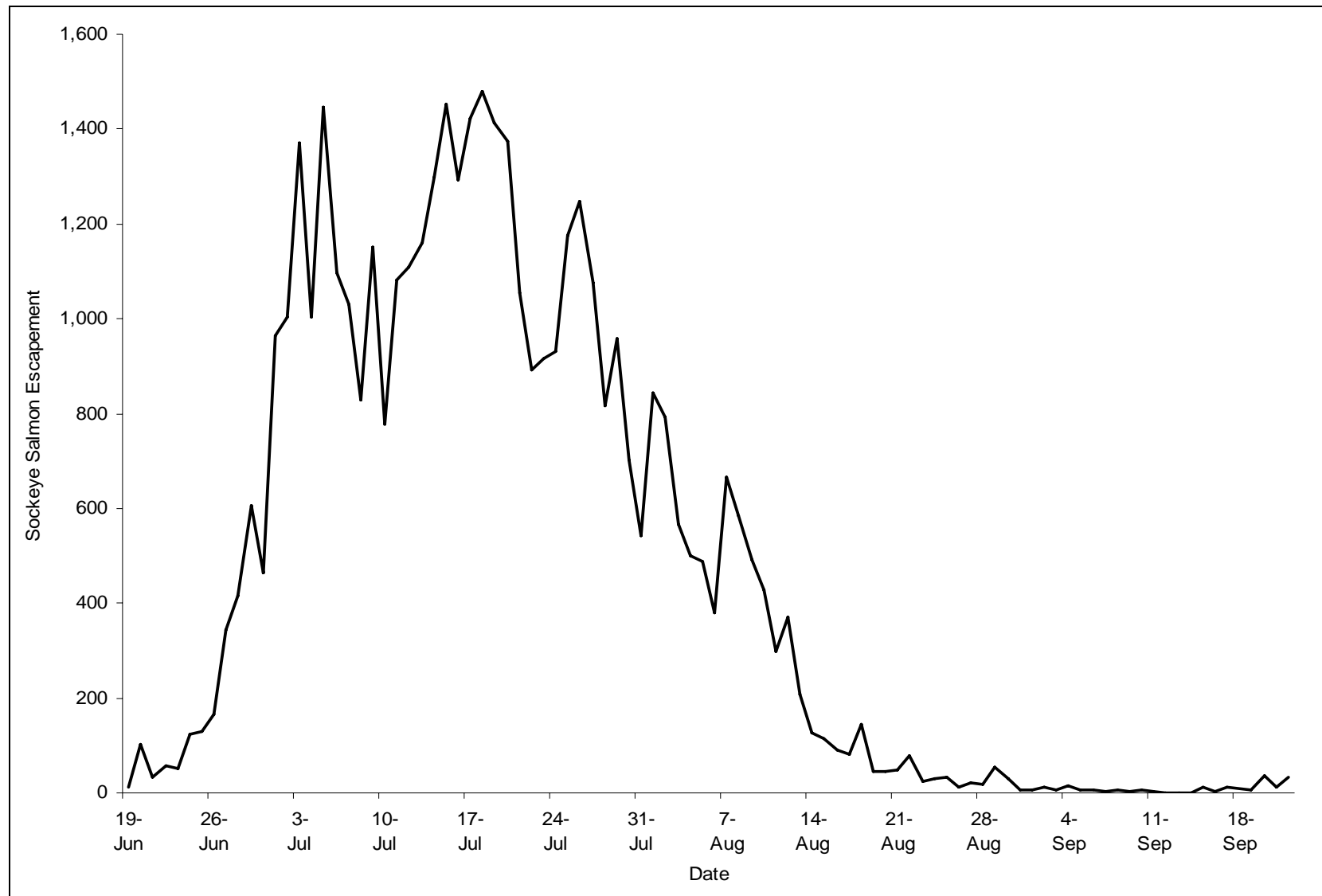
**Figure 3.**—Locations of Kodiak Island road system lakes that are to be stocked with rainbow trout in 2007.





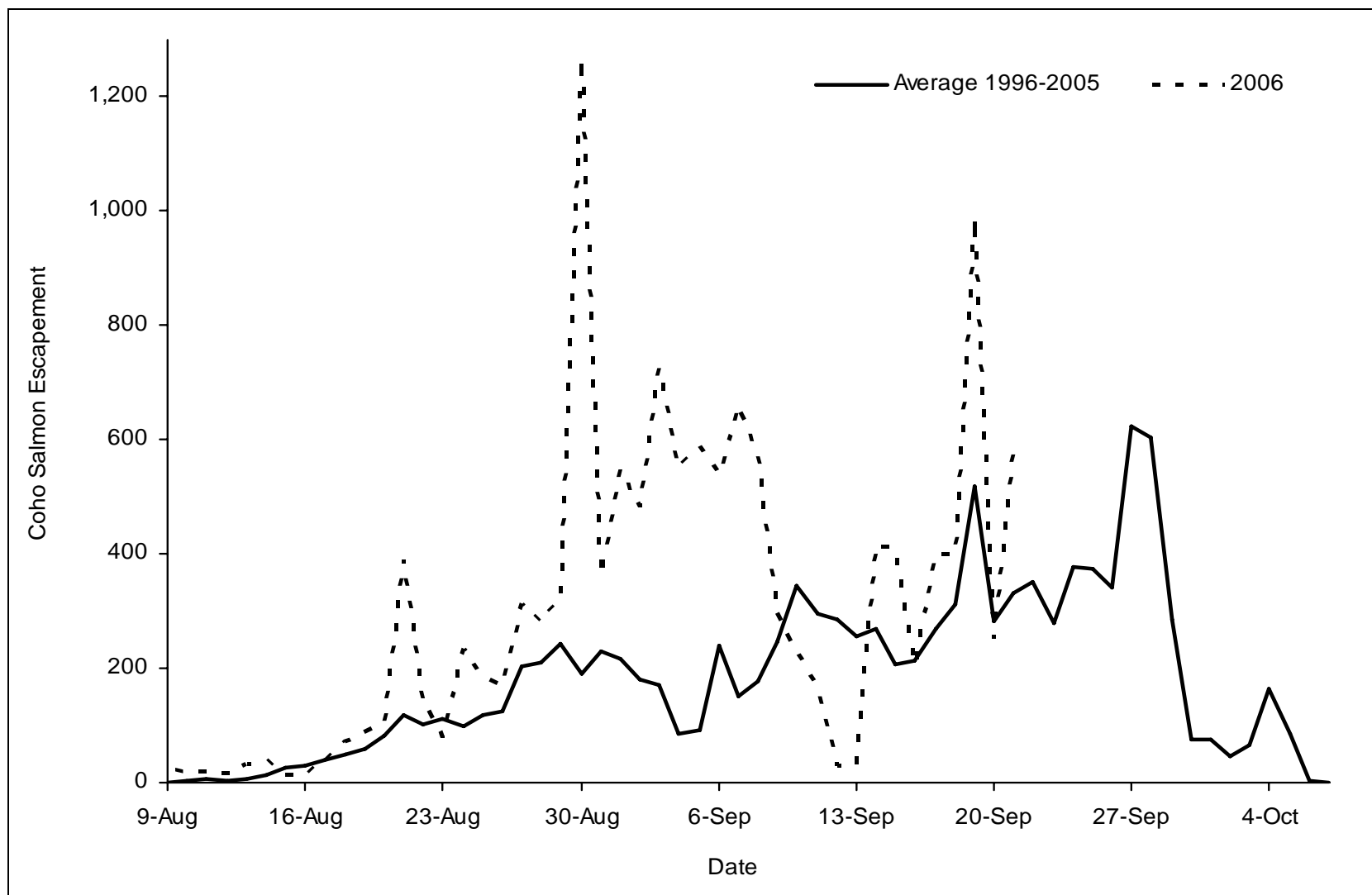
**Figure 4.**—Afognak Lake (Litnik) sockeye salmon average escapement timing (1996-2005) compared to the 2006 escapement timing.





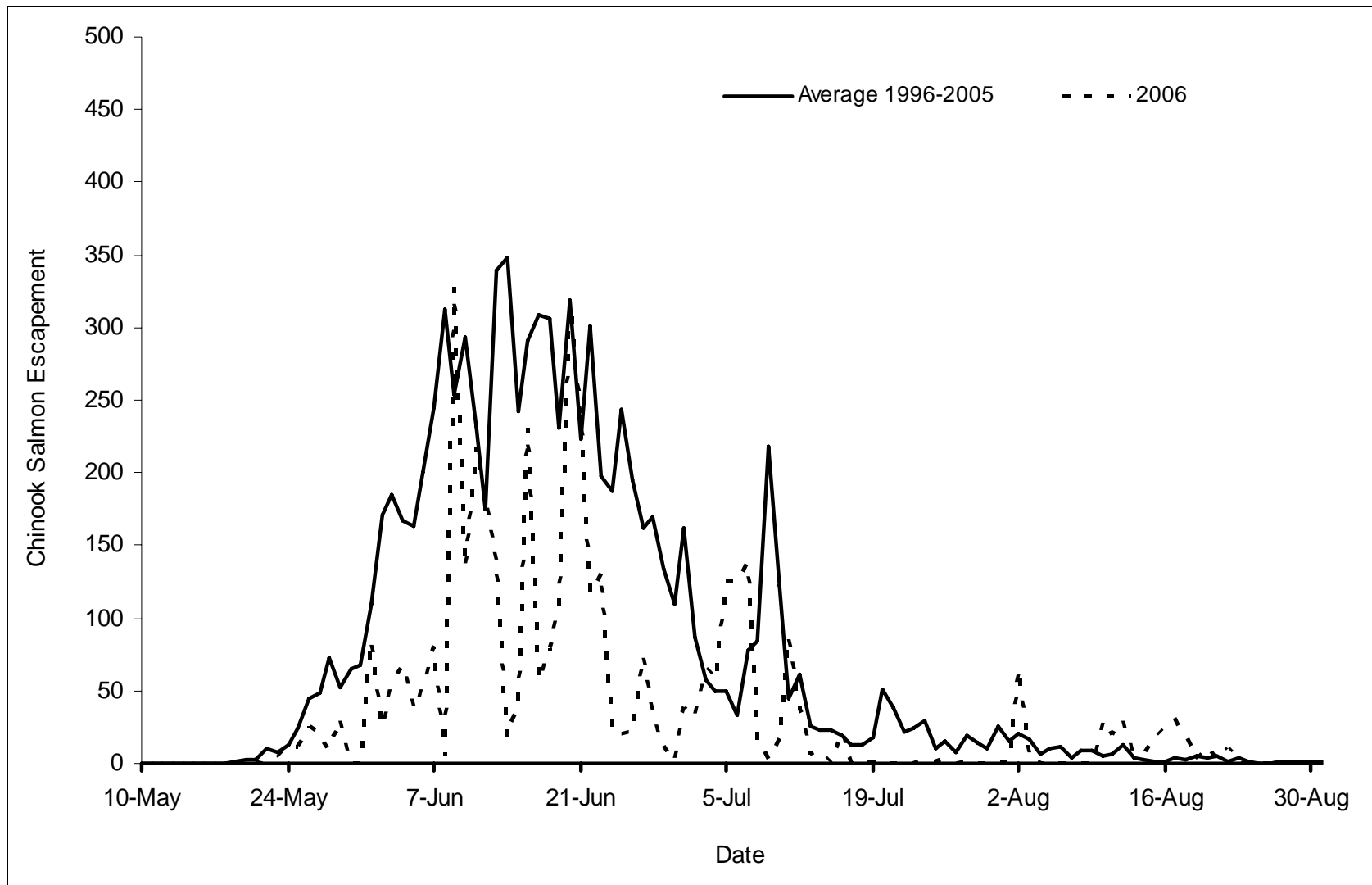
**Figure 5.**—Saltery Lake sockeye salmon average escapement timing, 1994-2003 (the weir has not operated since 2003).





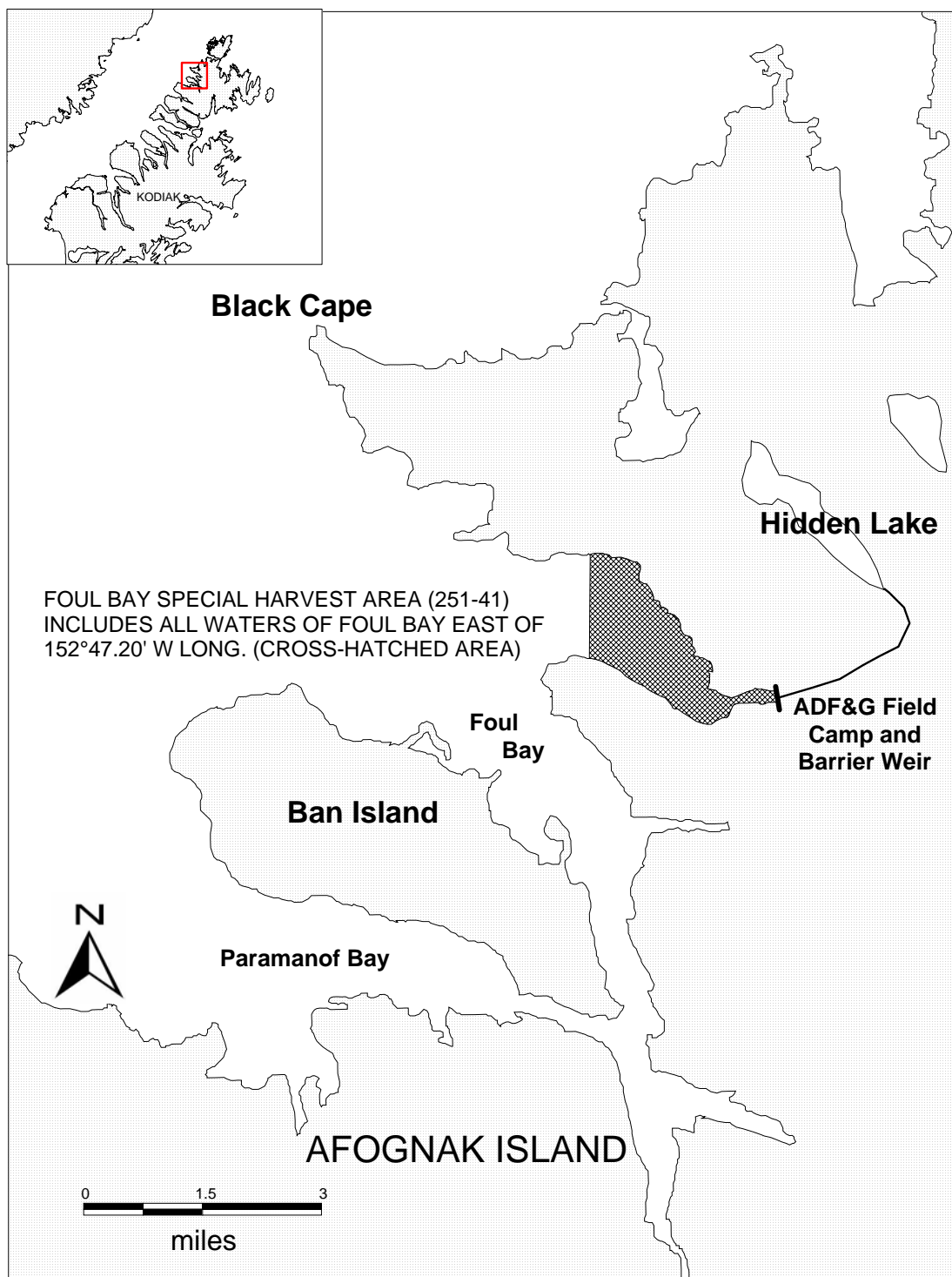
**Figure 6.**—Buskin River coho salmon average escapement timing (1996-2005) compared to the 2006 escapement timing.





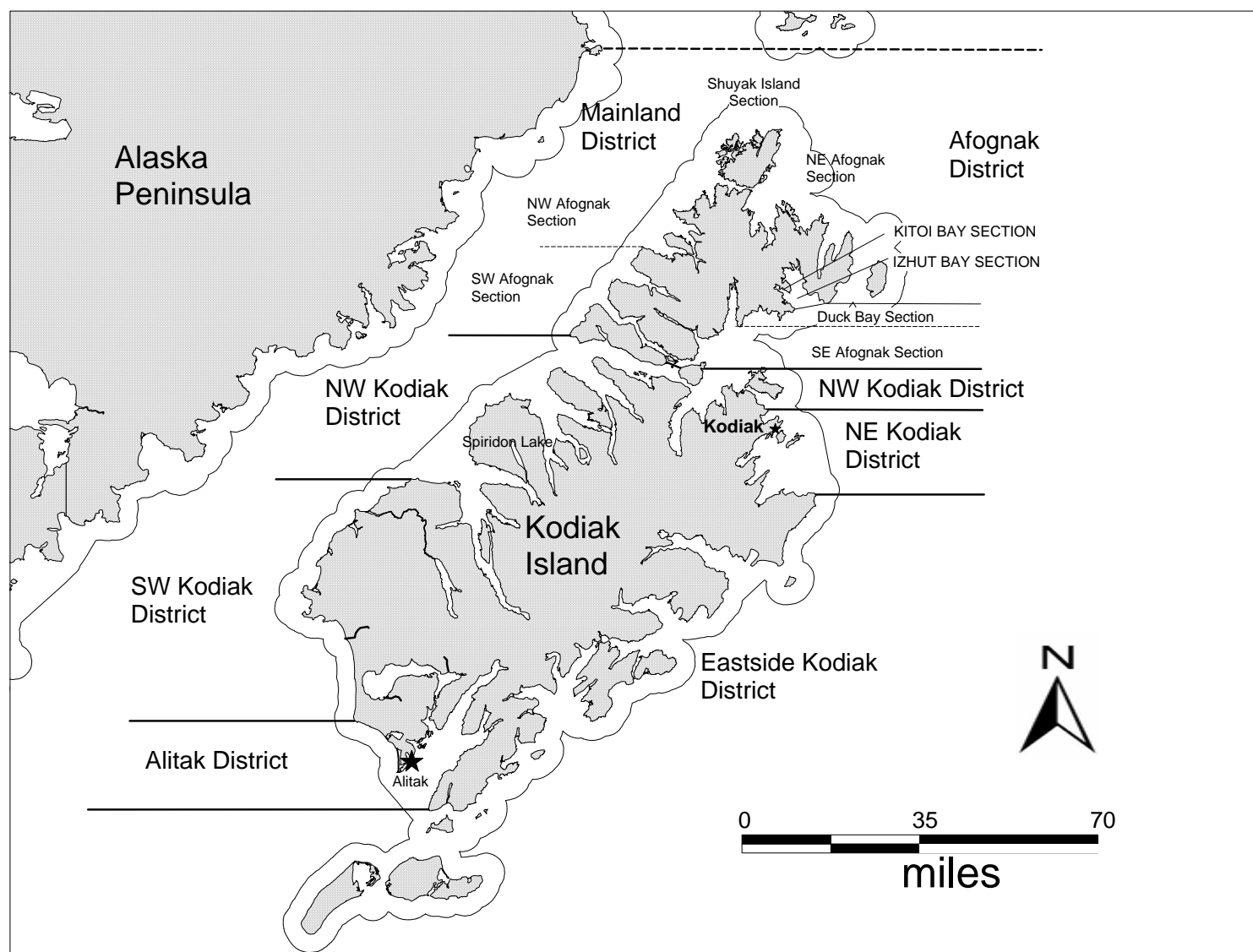
**Figure 7.**—Karluk River Chinook salmon average escapement timing (1996-2005) compared to the 2006 escapement timing.





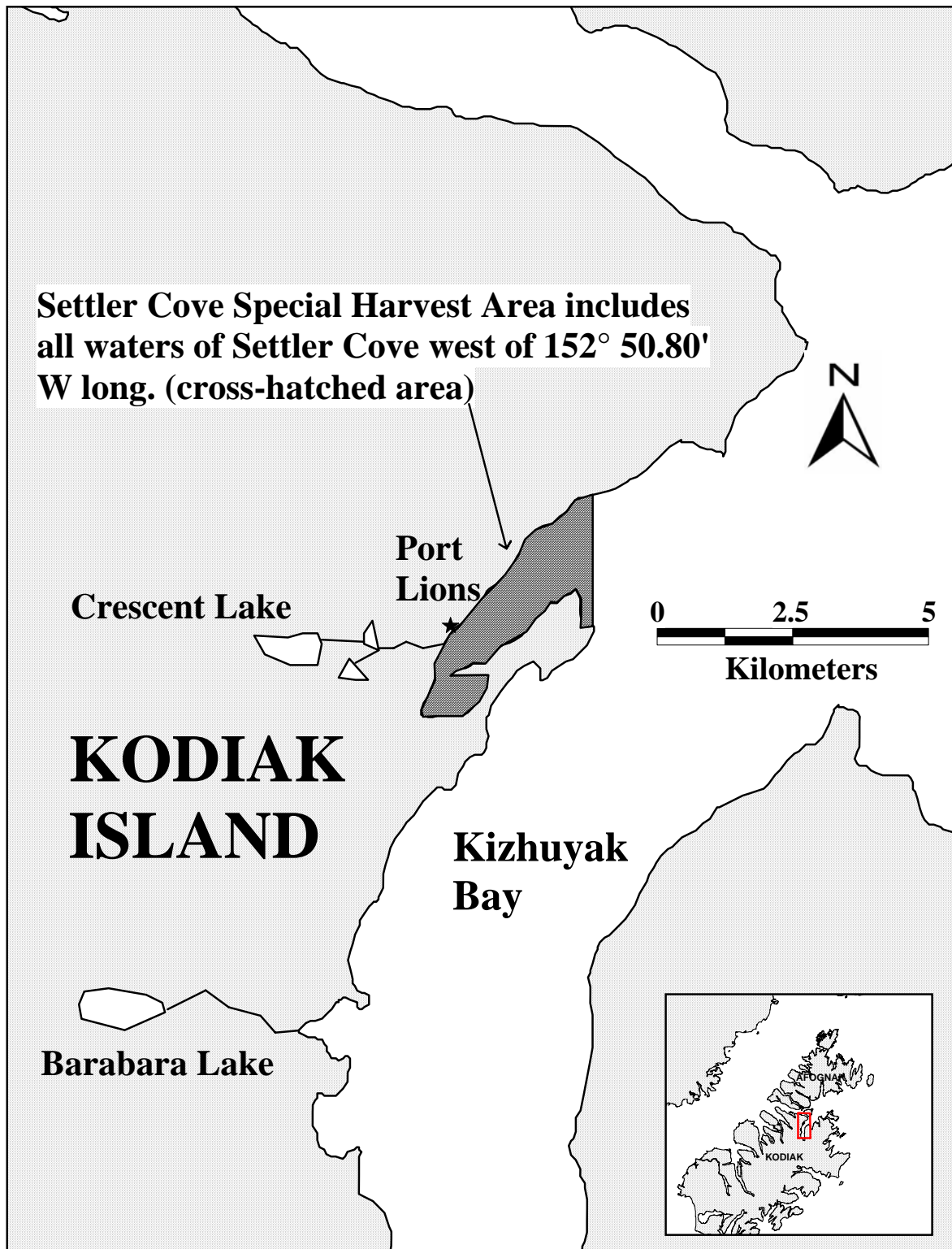
**Figure 8.**—Location of the Foul Bay special harvest area, and former locations of the ADF&G field camp and fish weir at Hidden Creek.





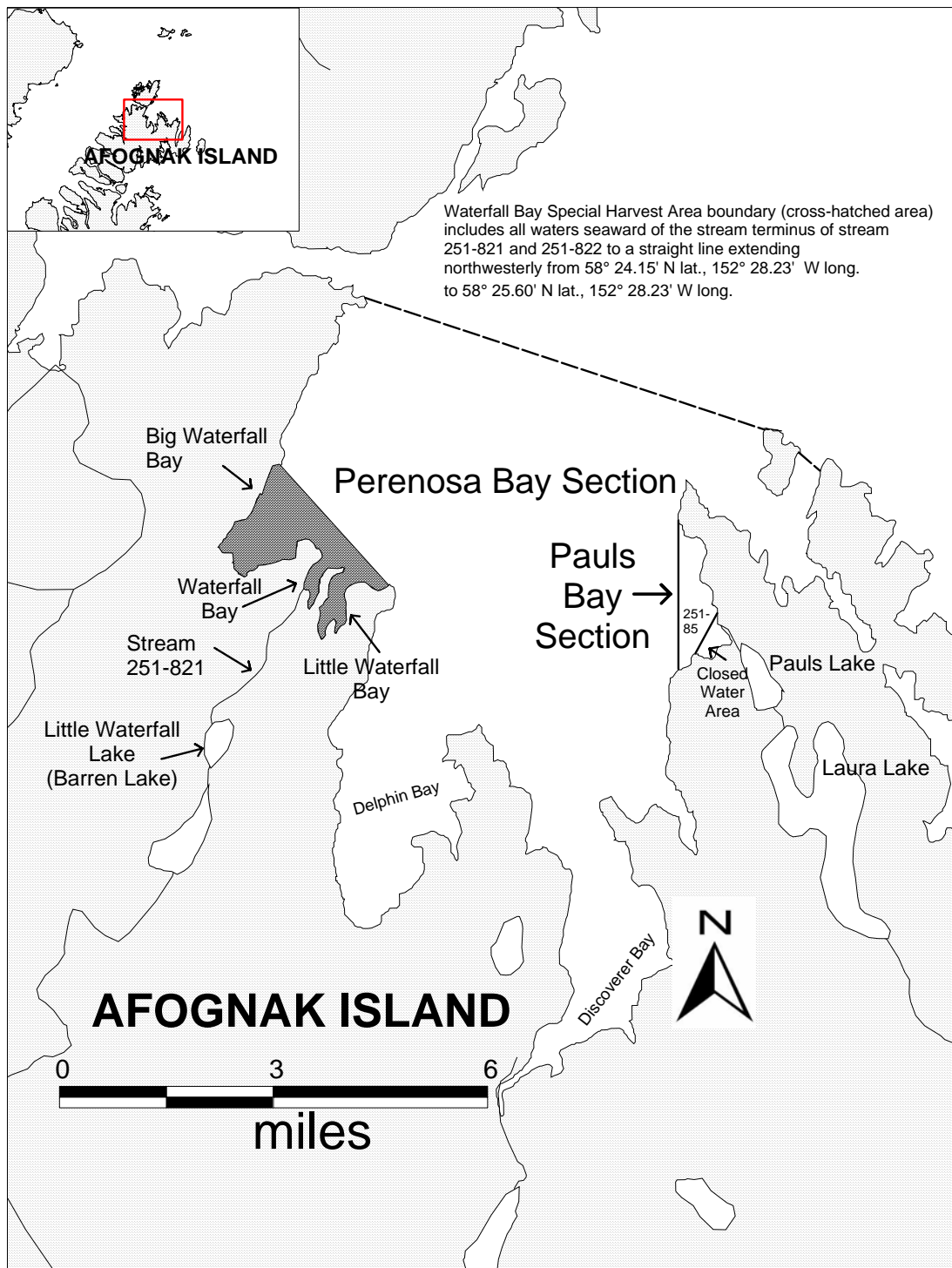
**Figure 9.**—Map of the Kodiak Management Area depicting commercial fishing districts and selected sections.





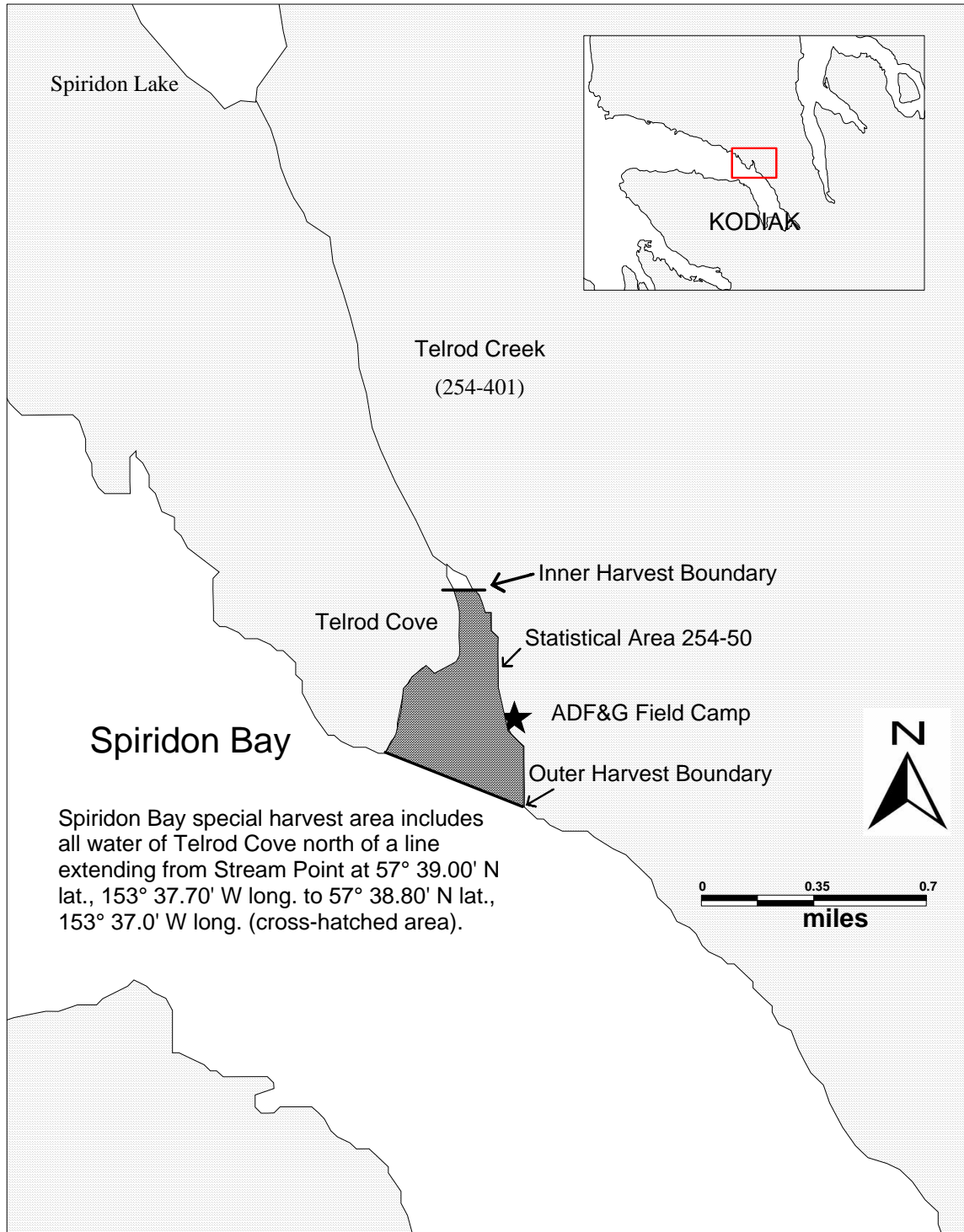
**Figure 10.**—Settler Cove (Crescent Lake) special harvest area boundaries in Kizhuyak Bay.





**Figure 11.**—Waterfall Bay (Little and Big Waterfall Lakes) special harvest area, Pauls Bay system (Pauls and Laura Lakes), and the Pauls Bay Section in Perenosa Bay.





**Figure 12.**—Spiridon Bay (Telrod Cove) special harvest area boundaries, and ADF&G camp location in Telrod Cove.







**APPENDIX A. PILLAR CREEK HATCHERY SALMON EGG  
TAKES, 1991-2007**



**Appendix A1.**—Pillar Creek Hatchery sockeye salmon egg takes at Afognak Lake, 1991-2007.

Brood Year	Adult Salmon	Eggs (millions)	Number Stocked	Year Stocked	Stocking Location
1991	2,076	2.6	260,000	1992	Hidden Lake
			399,000	1992	Crescent Lake
			493,000	1992	Little Waterfall Lake
			96,000	1992	Big Waterfall Lake
			464,000	1992	Afognak Lake
			182,000	1992	Little Kitoi Bay
1992	1,890	2.7	554,600	1993	Hidden Lake
			202,000	1993	Crescent Lake
			205,000	1993	Little Waterfall Lake
1993	2,169	3.4	250,000	1994	Hidden Lake
			314,000	1994	Crescent Lake
			150,000	1994	Little Waterfall Lake
			183,000	1994	Little Kitoi Lake
			311,000	1994	Afognak Lake
			293,000	1994	Little Kitoi Bay
			3,500	1995	Little Kitoi Lake
			97,800	1995	Little Waterfall Lake
1994	1,190	1.6	98,650	1995	Hidden Lake
			90,200	1995	Crescent Lake
			100,000	1995	Little Waterfall Lake
			112,900	1995	Little Kitoi Lake
1995	1,440	2.2	390,800	1996	Hidden Lake
			427,000	1996	Crescent Lake
			82,300	1996	Little Waterfall Lake
			146,000	1996	Sorg Lake
			50,600	1996	Little Kitoi Lake
			528,000	1996	Afognak Lake
1996	1,700	2.2	455,200	1997	Hidden Lake
			432,000	1997	Crescent Lake
			246,800	1997	Little Waterfall Lake
			125,800	1997	Little Kitoi Lake
			328,300	1997	Afognak Lake
1997	1,600	2.4	340,400	1998	Hidden Lake
			571,000	1998	Crescent Lake
			237,300	1998	Little Waterfall Lake
			422,700	1998	Afognak Lake
1998	1,060	1.6	310,000	1999	Hidden Lake
			273,000	1999	Little Waterfall Lake
			42,000	1999	Big Waterfall Lake
			371,700	1999	Crescent Lake

-continued-



**Appendix A1.**–Page 2 of 2.

Brood Year	Adult Salmon	Eggs (millions)	Number Stocked	Year Stocked	Stocking Location
1999	1,350	1.8	504,400	2000	Hidden Lake
			358,800	2000	Little Waterfall Lake
			124,400	2000	Big Waterfall Lake
			206,000	2000	Crescent Lake
2000	1,420	2.1	315,500	2001	Hidden Lake
			310,000	2001	Little Waterfall Lake
			224,300	2001	Big Waterfall Lake
			331,500	2001	Crescent Lake
2001	290	0.4	51,600	2002	Hidden Lake
			46,100	2002	Little Waterfall Lake
			44,300	2002	Big Waterfall Lake
			33,600	2002	Crescent Lake
2002	180	0.3	31,000	2003	Hidden Lake
			72,500	2003	Little Waterfall Lake
			0	2003	Big Waterfall Lake
			36,500	2003	Crescent Lake
2003	268	0.4	64,100	2004	Hidden Lake
			16,600	2004	Little Waterfall Lake
			16,600	2004	Big Waterfall Lake
			22,750	2004	Crescent Lake
2004 <sup>a</sup>	0	0.0	0	2005	
2005 <sup>b</sup>	1,296	1.3	421,700	2006	Hidden Lake
			0	2006	Little Waterfall Lake
			238,000	2006	Crescent Lake
2006	1,445	1.7	480,000	2007	Hidden Lake
			240,000	2007	Little Waterfall Lake
			90,000	2007	Big Waterfall Lake
			315,000	2007	Crescent Lake
2007 <sup>c</sup>	1,439	1.5	500,000	2008	Hidden Lake
			250,000	2008	Little Waterfall Lake
			100,000	2008	Big Waterfall Lake
			300,000	2008	Crescent Lake

<sup>a</sup> No egg take occurred at Afognak Lake in 2004. Malina Lake was utilized as an alternative broodstock for early-run sockeye stocking projects because adult returns to Afognak Lake had been depressed since 2001.

<sup>b</sup> Afognak Lake was one of two brood sources utilized for the 2005 early-run sockeye eggtake; Malina Lake sockeye were also utilized. A total of 1,917,609 early run sockeye eggs were taken from the two brood sources in 2005.

<sup>c</sup> Afognak Lake is the preferred brood source for the 2007 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2007 brood source if eggtake goals cannot be achieved using Afognak Lake sockeye salmon; egg take goal will be determined after inseason limnology evaluation and escapement results.



**Appendix A2.**—Pillar Creek Hatchery sockeye salmon egg takes at Saltery Lake, 1994-2007.

Brood Year	Adult Salmon	Eggs (millions)	Hatchery <sup>a</sup>	Number Stocked	Year Stocked	Stocking Location
1994	4,238	7.60	PCH	4,599,000	1995	Spiridon Lake
1995	122	0.20	PCH	150,000	1996	Ruth Lake
1996	103	0.20	PCH	147,000	1997	Ruth Lake
1997	2,700	4.00	PCH	3,340,000	1998	Spiridon Lake
			PCH	100,000	1998	Ruth Lake
			KBH	106,700	1999	Little Kitoi Lake
1998	2,560	4.30	PCH	3,564,000	1999	Spiridon Lake
			PCH	66,500	1999	Ruth Lake
			KBH	98,700	1999	Little Kitoi Lake
			KBH	74,500	2000	Little Kitoi Lake
			KBH	23,800	2000	Little Kitoi Bay
1999	4,318	6.80	PCH	4,397,100	2000	Spiridon Lake
			PCH	78,700	2000	Ruth Lake
			KBH	154,000	2000	Little Kitoi Lake
2000	2,582	4.80	PCH	1,700,600	2001	Spiridon Lake
			PCH	0	2001	Ruth Lake
			KBH	282,100	2001	Little Kitoi Lake
2001	845	1.57	PCH	1,182,000	2002	Spiridon Lake
			PCH	0	2002	Ruth Lake
			KBH	212,400	2002	Little Kitoi Lake
2002	2,000	3.30	PCH	1,417,500	2003	Spiridon Lake
			PCH	0	2003	Ruth Lake
			KBH	102,800	2003	Little Kitoi Lake
			KBH	193,600	2004	Little Kitoi Lake
2003	4,175	5.96	PCH	2,800,000	2004	Spiridon Lake
			PCH	111,400	2004	Ruth Lake
			PCH	0	2004	Jennifer Lake
			PCH	97,400	2004	Little Kitoi Lake
			KBH	20,700	2004	Little Kitoi Lake
			KBH	280,000	2005	Little Kitoi Lake
2004	4,079	4.99	PCH	1,380,000	2005	Spiridon Lake
			PCH	35,000	2005	Ruth Lake
			PCH	0	2005	Jennifer Lake
			PCH	56,900	2005	Little Kitoi Lake
			KBH	20,700	2005	Little Kitoi Lake
			KBH	380,000	2006	Little Kitoi Lake

-continued-



**Appendix A2.**–Page 2 of 2.

Brood Year	Adult Salmon	Eggs (millions)	Hatchery <sup>a</sup>	Number Stocked	Year Stocked	Stocking Location
2005	5,422	6.39	PCH	3,196,500	2006	Spiridon Lake
			PCH	46,800	2006	Ruth Lake
			PCH	2,290	2006	Jennifer Lake
			PCH	0	2006	Little Kitoi Lake
			KBH	206,900	2006	Little Kitoi Lake
			KBH	404,000	2007	Little Kitoi Lake
2006 <sup>b</sup>	3,537	4.41	PCH	1,750,000	2007	Spiridon Lake
			PCH	50,000	2007	Ruth Lake
			PCH	270,000	2007	Jennifer Lake
			PCH		2007	Little Kitoi Lake
			KBH	100,000	2007	Little Kitoi Lake
			KBH	400,000	2008	Little Kitoi Lake
2007 <sup>c</sup>	3,820	5.04	PCH	3,550,000	2008	Spiridon Lake
			PCH	50,000	2008	Ruth Lake
			PCH	275,000	2008	Jennifer Lake
			PCH	100,000	2008	Little Kitoi Lake
			KBH	100,000	2008	Little Kitoi Lake
			KBH	400,000	2009	Little Kitoi Lake

<sup>a</sup> Pillar Creek Hatchery (PCH), Kitoi Bay Hatchery (KBH).

<sup>b</sup> Brood year 2006 stocking figures are projected.

<sup>c</sup> Egg take goal to be determined after inseason limnology evaluation and escapement results.



**Appendix A3.**—Pillar Creek Hatchery coho salmon egg takes, 1991-2007.

Brood Year	Adult Salmon	Green Eggs	Number Stocked	Year Stocked	Stocking Location
<u>Monashka Creek stock:</u>					
1991	25	60,100	52,000	1992	Monashka Creek
1992	6	10,500	9,000	1993	Monashka Creek
<u>Buskin River stock:</u>					
1993 <sup>a</sup>	78	156,000	136,200	1994	Kodiak Road System Lakes <sup>b</sup>
1994	56	98,000	76,140	1995	"
1995	85	120,000	28,000	1996	"
1996	65	177,000	148,200	1997	"
1997	65	153,000	134,500	1998	"
1998	102	158,000	128,000	1999	"
1999	40	91,000	63,800	2000	"
2000	60	112,000	73,400	2001	"
2001	60	146,000	110,000	2002	"
2002	29	57,100	48,300	2003	"
	25	51,000	43,100	2004	Kodiak road system lakes, Monashka Creek <sup>c</sup>
2003	49	98,500	88,100	2004	"
	21	43,200	33,500	2005	"
2004	22	36,700	33,900	2005	"
	32	54,100	48,600	2006	"
2005	39	76,600	33,000	2006	"
	17	19,800	8,500	2007	"
2006	60	114,500	99,000	2007	"
	0	0	0	2008	"
2007	46	87,700	79,000	2008	"
	6	11,100	10,000	2009	"

<sup>a</sup> Prior to 1993, Kitoi Bay Hatchery supplied juvenile coho salmon for stocking the road system lakes.

<sup>b</sup> Road system lakes include: Island, Dark, Mission, Potato Patch, Big (Lily), Mayflower, Southern (on Long Island), Margaret (Boy Scout), and Abercrombie (Gertrude) Lakes.

<sup>c</sup> Smolt releases occur only as rearing space allows. Lower than anticipated Chinook production can make available rearing space for spring coho smolt production. The determination to take eggs for coho smolt is made just prior to the coho egg take, when Chinook egg survival for the brood year has been assessed.



**Appendix A4.**—Pillar Creek Hatchery Chinook salmon egg takes, 2000-2007.

Brood Year	Adult Salmon	Number of Eggs	Number Stocked	Year Stocked	Stocking Location
2000 <sup>a</sup>	48	124,818	60,400	2002	Monashka Creek
2001	34	86,120	34,000	2003	Monashka Creek
2002	59	147,000	12,300	2004	Monashka Creek
2003	70	172,300	72,150	2005	Monashka Creek
2004	76	181,600	29,000	2006	Monashka Creek
2005 <sup>a</sup>	92	208,700	106,500	2007	Monashka Creek
2006	123	357,100	290,000	2007-2008	Monashka Creek
2007	60	170,000	130,000	2009	Monashka Creek

<sup>a</sup> Chinook egg takes for Brood Years 2000-2004 were conducted at the Karluk River. 2005 was the first year that adult progeny of the Chinook project returned to Monashka Creek. The 2005 egg take was conducted at Monashka Creek, utilizing a portion of the run as brood. Monashka Creek will be the preferred brood source for 2007, but eggs could also be taken from Karluk River brood. The combined total of the egg takes will not exceed 300,000 eggs.



**Appendix A5.**—Pillar Creek Hatchery sockeye salmon egg takes at Malina Lakes, 1991-2007.

Brood Year	Adult Salmon	Eggs (millions)	Number Stocked	Year Stocked	Stocking Location
1991	120	0.141	85,000	1992	Malina Lake
1992	1,005	1.410	318,000	1993	Malina Lake
1993	644	0.930	547,000	1994	Malina Lake
1994	350	0.475	53,500	1995	Malina Lake
1995	400	0.590	426,300	1996	Malina Lake
1996	454	0.791	390,400	1997	Malina Lake
1997	470	0.800	350,500	1998	Malina Lake
1998 <sup>a</sup>	550	0.710	406,000	1999	Malina Lake
2004 <sup>b</sup>	2,450	1.582	188,300	2005	Hidden Lake
			78,700	2005	Little Waterfall Lake
			49,100	2005	Big Waterfall Lake
			54,000	2005	Crescent Lake
2005 <sup>c</sup>	727	0.647	184,600	2006	Little Waterfall Lake
			75,100	2006	Big Waterfall Lake
			80,800	2006	Malina Lake
2006	0	0.000	0	2007	No egg takes conducted.
2007 <sup>d</sup>	1,650	1.500	500,000	2008	Hidden Lake
			250,000	2008	Little Waterfall Lake
			100,000	2008	Big Waterfall Lake
			300,000	2008	Crescent Lake

<sup>a</sup> Escapement goal was achieved from 1999 to 2002 and no additional rehabilitation egg takes are planned.

<sup>b</sup> Malina Lake sockeye were utilized as an alternative broodstock for early-run sockeye enhancement projects in 2004. Afognak Lake had been the primary broodstock in the 1990s, but adult returns have been lower since 2001.

<sup>c</sup> Malina Lake was one of two brood sources utilized for the 2005 early-run sockeye egg take; Afognak Lake sockeye were also utilized. A total of 1,917,609 early run sockeye eggs were taken from the two brood sources in 2005.

<sup>d</sup> Afognak Lake is the preferred brood source for the 2007 early-run sockeye egg take. Malina Lake sockeye may be utilized as a 2007 brood source, if egg-take goals cannot be achieved using Afognak Lake sockeye salmon.



**APPENDIX B. WORKSHEETS FOR BROODSTOCK  
NUMBERS AND REPLACEMENT OPTIONS FOR  
ADULT REMOVALS**



**Appendix B1.**–Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Afognak Lake.

50% Lower Bound EGR	2007 Escapement	Broodstock Allowed	50% Lower Bound EGR	2007 Escapement	Broodstock Allowed	50% Lower Bound EGR	2007 Escapement	Broodstock Allowed
10,000	15,000	<b>5,000</b>	10,000	13,250	<b>3,250</b>	10,000	11,500	<b>1,500</b>
10,000	14,950	<b>4,950</b>	10,000	13,200	<b>3,200</b>	10,000	11,450	<b>1,450</b>
10,000	14,900	<b>4,900</b>	10,000	13,150	<b>3,150</b>	10,000	11,400	<b>1,400</b>
10,000	14,850	<b>4,850</b>	10,000	13,100	<b>3,100</b>	10,000	11,350	<b>1,350</b>
10,000	14,800	<b>4,800</b>	10,000	13,050	<b>3,050</b>	10,000	11,300	<b>1,300</b>
10,000	14,750	<b>4,750</b>	10,000	13,000	<b>3,000</b>	10,000	11,250	<b>1,250</b>
10,000	14,700	<b>4,700</b>	10,000	12,950	<b>2,950</b>	10,000	11,200	<b>1,200</b>
10,000	14,650	<b>4,650</b>	10,000	12,900	<b>2,900</b>	10,000	11,150	<b>1,150</b>
10,000	14,600	<b>4,600</b>	10,000	12,850	<b>2,850</b>	10,000	11,100	<b>1,100</b>
10,000	14,550	<b>4,550</b>	10,000	12,800	<b>2,800</b>	10,000	11,050	<b>1,050</b>
10,000	14,500	<b>4,500</b>	10,000	12,750	<b>2,750</b>	10,000	11,000	<b>1,000</b>
10,000	14,450	<b>4,450</b>	10,000	12,700	<b>2,700</b>	10,000	10,950	<b>950</b>
10,000	14,400	<b>4,400</b>	10,000	12,650	<b>2,650</b>	10,000	10,900	<b>900</b>
10,000	14,350	<b>4,350</b>	10,000	12,600	<b>2,600</b>	10,000	10,850	<b>850</b>
10,000	14,300	<b>4,300</b>	10,000	12,550	<b>2,550</b>	10,000	10,800	<b>800</b>
10,000	14,250	<b>4,250</b>	10,000	12,500	<b>2,500</b>	10,000	10,750	<b>750</b>
10,000	14,200	<b>4,200</b>	10,000	12,450	<b>2,450</b>	10,000	10,700	<b>700</b>
10,000	14,150	<b>4,150</b>	10,000	12,400	<b>2,400</b>	10,000	10,650	<b>650</b>
10,000	14,100	<b>4,100</b>	10,000	12,350	<b>2,350</b>	10,000	10,600	<b>600</b>
10,000	14,050	<b>4,050</b>	10,000	12,300	<b>2,300</b>	10,000	10,550	<b>550</b>
10,000	14,000	<b>4,000</b>	10,000	12,250	<b>2,250</b>	10,000	10,500	<b>500</b>
10,000	13,950	<b>3,950</b>	10,000	12,200	<b>2,200</b>	10,000	10,450	<b>450</b>
10,000	13,900	<b>3,900</b>	10,000	12,150	<b>2,150</b>	10,000	10,400	<b>400</b>
10,000	13,850	<b>3,850</b>	10,000	12,100	<b>2,100</b>	10,000	10,350	<b>350</b>
10,000	13,800	<b>3,800</b>	10,000	12,050	<b>2,050</b>	10,000	10,300	<b>300</b>
10,000	13,750	<b>3,750</b>	10,000	12,000	<b>2,000</b>	10,000	10,250	<b>250</b>
10,000	13,700	<b>3,700</b>	10,000	11,950	<b>1,950</b>	10,000	10,200	<b>200</b>
10,000	13,650	<b>3,650</b>	10,000	11,900	<b>1,900</b>	10,000	10,150	<b>150</b>
10,000	13,600	<b>3,600</b>	10,000	11,850	<b>1,850</b>	10,000	10,100	<b>100</b>
10,000	13,550	<b>3,550</b>	10,000	11,800	<b>1,800</b>	10,000	10,050	<b>50</b>
10,000	13,500	<b>3,500</b>	10,000	11,750	<b>1,750</b>	10,000	10,000	<b>0</b>
10,000	13,450	<b>3,450</b>	10,000	11,700	<b>1,700</b>	10,000	9,950	<b>0</b>
10,000	13,400	<b>3,400</b>	10,000	11,650	<b>1,650</b>	10,000	9,900	
10,000	13,350	<b>3,350</b>	10,000	11,600	<b>1,600</b>	10,000	9,850	
10,000	13,300	<b>3,300</b>	10,000	11,550	<b>1,550</b>	10,000	9,800	



**Appendix B2.**—Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at the Malina Lakes.

50% Lower Bound	2007	Broodstock	50% Lower Bound	2007	Broodstock	50% Lower	2007	Broodstock
EGR	Escapement	Allowed	EGR	Escapement	Allowed	Bound EGR	Escapement	Allowed
500	3,000	<b>2,500</b>	500	2,125	<b>1,625</b>	500	1,250	<b>750</b>
500	2,975	<b>2,475</b>	500	2,100	<b>1,600</b>	500	1,225	<b>725</b>
500	2,950	<b>2,450</b>	500	2,075	<b>1,575</b>	500	1,200	<b>700</b>
500	2,925	<b>2,425</b>	500	2,050	<b>1,550</b>	500	1,175	<b>675</b>
500	2,900	<b>2,400</b>	500	2,025	<b>1,525</b>	500	1,150	<b>650</b>
500	2,875	<b>2,375</b>	500	2,000	<b>1,500</b>	500	1,125	<b>625</b>
500	2,850	<b>2,350</b>	500	1,975	<b>1,475</b>	500	1,100	<b>600</b>
500	2,825	<b>2,325</b>	500	1,950	<b>1,450</b>	500	1,075	<b>575</b>
500	2,800	<b>2,300</b>	500	1,925	<b>1,425</b>	500	1,050	<b>550</b>
500	2,775	<b>2,275</b>	500	1,900	<b>1,400</b>	500	1,025	<b>525</b>
500	2,750	<b>2,250</b>	500	1,875	<b>1,375</b>	500	1,000	<b>500</b>
500	2,725	<b>2,225</b>	500	1,850	<b>1,350</b>	500	975	<b>475</b>
500	2,700	<b>2,200</b>	500	1,825	<b>1,325</b>	500	950	<b>450</b>
500	2,675	<b>2,175</b>	500	1,800	<b>1,300</b>	500	925	<b>425</b>
500	2,650	<b>2,150</b>	500	1,775	<b>1,275</b>	500	900	<b>400</b>
500	2,625	<b>2,125</b>	500	1,750	<b>1,250</b>	500	875	<b>375</b>
500	2,600	<b>2,100</b>	500	1,725	<b>1,225</b>	500	850	<b>350</b>
500	2,575	<b>2,075</b>	500	1,700	<b>1,200</b>	500	825	<b>325</b>
500	2,550	<b>2,050</b>	500	1,675	<b>1,175</b>	500	800	<b>300</b>
500	2,525	<b>2,025</b>	500	1,650	<b>1,150</b>	500	775	<b>275</b>
500	2,500	<b>2,000</b>	500	1,625	<b>1,125</b>	500	750	<b>250</b>
500	2,475	<b>1,975</b>	500	1,600	<b>1,100</b>	500	725	<b>225</b>
500	2,450	<b>1,950</b>	500	1,575	<b>1,075</b>	500	700	<b>200</b>
500	2,425	<b>1,925</b>	500	1,550	<b>1,050</b>	500	675	<b>175</b>
500	2,400	<b>1,900</b>	500	1,525	<b>1,025</b>	500	650	<b>150</b>
500	2,375	<b>1,875</b>	500	1,500	<b>1,000</b>	500	625	<b>125</b>
500	2,350	<b>1,850</b>	500	1,475	<b>975</b>	500	600	<b>100</b>
500	2,325	<b>1,825</b>	500	1,450	<b>950</b>	500	575	<b>75</b>
500	2,300	<b>1,800</b>	500	1,425	<b>925</b>	500	550	<b>50</b>
500	2,275	<b>1,775</b>	500	1,400	<b>900</b>	500	525	<b>25</b>
500	2,250	<b>1,750</b>	500	1,375	<b>875</b>	500	500	<b>0</b>
500	2,225	<b>1,725</b>	500	1,350	<b>850</b>	500	475	<b>0</b>
500	2,200	<b>1,700</b>	500	1,325	<b>825</b>	500	450	
500	2,175	<b>1,675</b>	500	1,300	<b>800</b>	500	425	
500	2,150	<b>1,650</b>	500	1,275	<b>775</b>	500	400	



**Appendix B3.**—Worksheet for determining sockeye salmon broodstock numbers allowed, based on escapement levels at Saltery Lake.

50% Lower Bound EGR	2007 Escapement	Broodstock Allowed	50% Lower Bound EGR	2007 Escapement	Broodstock Allowed	50% Lower Bound EGR	2007 Escapement	Broodstock Allowed
7,500	15,000	7,500	7,500	12,375	4,875	7,500	9,750	2,250
7,500	14,925	7,425	7,500	12,300	4,800	7,500	9,675	2,175
7,500	14,850	7,350	7,500	12,225	4,725	7,500	9,600	2,100
7,500	14,775	7,275	7,500	12,150	4,650	7,500	9,525	2,025
7,500	14,700	7,200	7,500	12,075	4,575	7,500	9,450	1,950
7,500	14,625	7,125	7,500	12,000	4,500	7,500	9,375	1,875
7,500	14,550	7,050	7,500	11,925	4,425	7,500	9,300	1,800
7,500	14,475	6,975	7,500	11,850	4,350	7,500	9,225	1,725
7,500	14,400	6,900	7,500	11,775	4,275	7,500	9,150	1,650
7,500	14,325	6,825	7,500	11,700	4,200	7,500	9,075	1,575
7,500	14,250	6,750	7,500	11,625	4,125	7,500	9,000	1,500
7,500	14,175	6,675	7,500	11,550	4,050	7,500	8,925	1,425
7,500	14,100	6,600	7,500	11,475	3,975	7,500	8,850	1,350
7,500	14,025	6,525	7,500	11,400	3,900	7,500	8,775	1,275
7,500	13,950	6,450	7,500	11,325	3,825	7,500	8,700	1,200
7,500	13,875	6,375	7,500	11,250	3,750	7,500	8,625	1,125
7,500	13,800	6,300	7,500	11,175	3,675	7,500	8,550	1,050
7,500	13,725	6,225	7,500	11,100	3,600	7,500	8,475	975
7,500	13,650	6,150	7,500	11,025	3,525	7,500	8,400	900
7,500	13,575	6,075	7,500	10,950	3,450	7,500	8,325	825
7,500	13,500	6,000	7,500	10,875	3,375	7,500	8,250	750
7,500	13,425	5,925	7,500	10,800	3,300	7,500	8,175	675
7,500	13,350	5,850	7,500	10,725	3,225	7,500	8,100	600
7,500	13,275	5,775	7,500	10,650	3,150	7,500	8,025	525
7,500	13,200	5,700	7,500	10,575	3,075	7,500	7,950	450
7,500	13,125	5,625	7,500	10,500	3,000	7,500	7,875	375
7,500	13,050	5,550	7,500	10,425	2,925	7,500	7,800	300
7,500	12,975	5,475	7,500	10,350	2,850	7,500	7,725	225
7,500	12,900	5,400	7,500	10,275	2,775	7,500	7,650	150
7,500	12,825	5,325	7,500	10,200	2,700	7,500	7,575	75
7,500	12,750	5,250	7,500	10,125	2,625	7,500	7,500	0
7,500	12,675	5,175	7,500	10,050	2,550	7,500	7,425	0
7,500	12,600	5,100	7,500	9,975	2,475	7,500	7,350	
7,500	12,525	5,025	7,500	9,900	2,400	7,500	7,275	
7,500	12,450	4,950	7,500	9,825	2,325	7,500	7,200	



**Appendix B4.**–Worksheet for calculating sockeye salmon “replacement” options for adult removals from Afognak Lake.

Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMEND ED <sup>a</sup> Fall Presmolt (8-10)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMEND ED <sup>a</sup> Fall Presmolt (8-10)
300	134	333,750	23,363	4,906	491	25,000	12,500	6,250	500	500	500
350	156	389,375	27,256	5,724	572	29,000	14,500	7,250	580	580	580
400	178	445,000	31,150	6,542	654	33,000	16,500	8,250	660	660	660
450	200	500,625	35,044	7,359	736	37,000	18,500	9,250	740	740	740
500	223	556,250	38,938	8,177	818	41,000	20,500	10,250	820	820	820
550	245	611,875	42,831	8,995	899	45,000	22,500	11,250	900	900	900
600	267	667,500	46,725	9,812	981	49,000	24,500	12,250	980	980	980
650	289	723,125	50,619	10,630	1,063	53,000	26,500	13,250	1,060	1,060	1,060
700	312	778,750	54,513	11,448	1,145	57,000	28,500	14,250	1,140	1,140	1,140
750	334	834,375	58,406	12,265	1,227	61,000	30,500	15,250	1,220	1,220	1,220
800	356	890,000	62,300	13,083	1,308	65,000	32,500	16,250	1,300	1,300	1,300
850	378	945,625	66,194	13,901	1,390	69,000	34,500	17,250	1,380	1,380	1,380
900	401	1,001,250	70,088	14,718	1,472	73,000	36,500	18,250	1,460	1,460	1,460
950	423	1,056,875	73,981	15,536	1,554	77,000	38,500	19,250	1,540	1,540	1,540
1,000	445	1,112,500	77,875	16,354	1,635	81,000	40,500	20,250	1,620	1,620	1,620
1,050	467	1,168,125	81,769	17,171	1,717	85,000	42,500	21,250	1,700	1,700	1,700
1,100	490	1,223,750	85,663	17,989	1,799	89,000	44,500	22,250	1,780	1,780	1,780
1,150	512	1,279,375	89,556	18,807	1,881	93,000	46,500	23,250	1,860	1,860	1,860
1,200	534	1,335,000	93,450	19,625	1,962	97,000	48,500	24,250	1,940	1,940	1,940
1,250	556	1,390,625	97,344	20,442	2,044	101,000	50,500	25,250	2,020	2,020	2,020
1,300	579	1,446,250	101,238	21,260	2,126	105,000	52,500	26,250	2,100	2,100	2,100
1,350	601	1,501,875	105,131	22,078	2,208	109,000	54,500	27,250	2,180	2,180	2,180
1,400	623	1,557,500	109,025	22,895	2,290	113,000	56,500	28,250	2,260	2,260	2,260
1,450	645	1,613,125	112,919	23,713	2,371	117,000	58,500	29,250	2,340	2,340	2,340
1,500	668	1,668,750	116,813	24,531	2,453	121,000	60,500	30,250	2,420	2,420	2,420
1,550	690	1,724,375	120,706	25,348	2,535	125,000	62,500	31,250	2,500	2,500	2,500
1,600	712	1,780,000	124,600	26,166	2,617	129,000	64,500	32,250	2,580	2,580	2,580
1,650	734	1,835,625	128,494	26,984	2,698	133,000	66,500	33,250	2,660	2,660	2,660
1,700	757	1,891,250	132,388	27,801	2,780	137,000	68,500	34,250	2,740	2,740	2,740
1,750	779	1,946,875	136,281	28,619	2,862	141,000	70,500	35,250	2,820	2,820	2,820
1,800	801	2,002,500	140,175	29,437	2,944	145,000	72,500	36,250	2,900	2,900	2,900
1,850	823	2,058,125	144,069	30,254	3,025	149,000	74,500	37,250	2,980	2,980	2,980
<b>1,900</b>	846	2,113,750	147,963	31,072	3,107	153,000	76,500	<b>38,250</b>	3,060	3,060	3,060
Assumptions: 1. "jack" % = 11% 2. Fecundity = 2500 3. Egg-to-emergence = 7% 4. Fry-to-smolt = 21% 5. Smolt-to- adult = 10% = ~1.6 Return per spawner						<b>Highlighted indicates proposed adult removals in 2006 and replacement stocking recommended for 2007.</b>			Assumptions: 1. Fry-to-adult - 2% 2. Fingerling-to-adult - 4% 3. Presmolt-to-adult - 8% Note: survivals are less than for Table 2 to account for interactions w/resident fish and smaller presmolt stocking size.		

<sup>a</sup> Presmolt stocking is recommended because late fall stocking should reduce competition for food with resident fish (majority should emigrate the following spring) and growth characteristics from scale patterns can be used to identify these fish when they return as adults.



**Appendix B5.**–Worksheet for calculating sockeye salmon “replacement” options for adult removals from the Malina Lakes.

Lost Production Estimates							Backstocking Options (1 only)			Returns from Backstocking by Option		
Adults Removed (all age)	Potential Females	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return		Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED <sup>a</sup> Fall Presmolt (8- 10 g)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED <sup>a</sup> Fall Presmolt (8- 10 g)
300	134	333,750	23,363	4,906	491		25,000	12,500	6,250	500	500	500
350	156	389,375	27,256	5,724	572		29,000	14,500	7,250	580	580	580
400	178	445,000	31,150	6,542	654		33,000	16,500	8,250	660	660	660
450	200	500,625	35,044	7,359	736		37,000	18,500	9,250	740	740	740
500	223	556,250	38,938	8,177	818		41,000	20,500	10,250	820	820	820
550	245	611,875	42,831	8,995	899		45,000	22,500	11,250	900	900	900
600	267	667,500	46,725	9,812	981		49,000	24,500	12,250	980	980	980
650	289	723,125	50,619	10,630	1,063		53,000	26,500	13,250	1,060	1,060	1,060
700	312	778,750	54,513	11,448	1,145		57,000	28,500	14,250	1,140	1,140	1,140
750	334	834,375	58,406	12,265	1,227		61,000	30,500	15,250	1,220	1,220	1,220
800	356	890,000	62,300	13,083	1,308		65,000	32,500	16,250	1,300	1,300	1,300
850	378	945,625	66,194	13,901	1,390		69,000	34,500	17,250	1,380	1,380	1,380
900	401	1,001,250	70,088	14,718	1,472		73,000	36,500	18,250	1,460	1,460	1,460
950	423	1,056,875	73,981	15,536	1,554		77,000	38,500	19,250	1,540	1,540	1,540
1,000	445	1,112,500	77,875	16,354	1,635		81,000	40,500	20,250	1,620	1,620	1,620
1,050	467	1,168,125	81,769	17,171	1,717		85,000	42,500	21,250	1,700	1,700	1,700
1,100	490	1,223,750	85,663	17,989	1,799		89,000	44,500	22,250	1,780	1,780	1,780
1,150	512	1,279,375	89,556	18,807	1,881		93,000	46,500	23,250	1,860	1,860	1,860
1,200	534	1,335,000	93,450	19,625	1,962		97,000	48,500	24,250	1,940	1,940	1,940
1,250	556	1,390,625	97,344	20,442	2,044		101,000	50,500	25,250	2,020	2,020	2,020
1,300	579	1,446,250	101,238	21,260	2,126		105,000	52,500	26,250	2,100	2,100	2,100
1,350	601	1,501,875	105,131	22,078	2,208		109,000	54,500	27,250	2,180	2,180	2,180
1,400	623	1,557,500	109,025	22,895	2,290		113,000	56,500	28,250	2,260	2,260	2,260
1,450	645	1,613,125	112,919	23,713	2,371		117,000	58,500	29,250	2,340	2,340	2,340
1,500	668	1,668,750	116,813	24,531	2,453		121,000	60,500	30,250	2,420	2,420	2,420
1,550	690	1,724,375	120,706	25,348	2,535		125,000	62,500	31,250	2,500	2,500	2,500
1,600	712	1,780,000	124,600	26,166	2,617		129,000	64,500	32,250	2,580	2,580	2,580
1,650	734	1,835,625	128,494	26,984	2,698		133,000	66,500	33,250	2,660	2,660	2,660
1,700	757	1,891,250	132,388	27,801	2,780		137,000	68,500	34,250	2,740	2,740	2,740
1,750	779	1,946,875	136,281	28,619	2,862		141,000	70,500	35,250	2,820	2,820	2,820
1,800	801	2,002,500	140,175	29,437	2,944		145,000	72,500	36,250	2,900	2,900	2,900
1,850	823	2,058,125	144,069	30,254	3,025		149,000	74,500	37,250	2,980	2,980	2,980
1,900	846	2,113,750	147,963	31,072	3,107		153,000	76,500	38,250	3,060	3,060	3,060
1,950	868	2,169,375	151,856	31,890	3,189		157,000	78,500	39,250	3,140	3,140	3,140
2,000	890	2,225,000	155,750	32,708	3,271		161,000	80,500	40,250	3,220	3,220	3,220
2,050	912	2,280,625	159,644	33,525	3,353		165,000	82,500	41,250	3,300	3,300	3,300
2,100	935	2,336,250	163,538	34,343	3,434		169,000	84,500	42,250	3,380	3,380	3,380
<b>2,150</b>	957	2,391,875	167,431	35,161	3,516		173,000	86,500	<b>43,250</b>	3,460	3,460	3,460
2,200	979	2,447,500	171,325	35,978	3,598		177,000	88,500	44,250	3,540	3,540	3,540
Assumptions: 1. "jack" % = 11% 2. Fecundity = 2500 3. Egg-to-emergence = 7% 4. Fry-to-smolt = 21% 5. Smolt-to- adult = 10% = ~1.6 Return per spawner							<b>Highlighted indicates proposed adult removals in 2006 and replacement stocking recommended for 2007.</b>			Assumptions: 1. Fry-to-adult - 2% 2. Fingerling-to-adult - 4% 3. Presmolt-to-adult - 8% Note: survivals are less than for Table 2 to account for interactions w/resident fish and smaller presmolt stocking size.		

<sup>a</sup> Presmolt stocking is recommended because late fall stocking should reduce competition for food with resident fish (majority should emigrate the following spring) and growth characteristics from scale patterns can be used to identify these fish when they return as adults.



**Appendix B6.**–Worksheet for calculating sockeye salmon “replacement” options for adult removals from Saltery Lake.

Lost Production Estimates						Backstocking Options (1 only)			Returns from Backstocking by Option			
Adults Removed (all age)	Potential Females	Potential Eggs	Potential Emergent Fry	Potential Smolt (4 g, 80 mm)	Potential Adult Return	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED <sup>a</sup> Fall Presmolt (8- 10 g)	Spring Fry (0.4 g)	Summer Fingerling (3.0 g)	RECOMMENDED <sup>a</sup> Fall Presmolt (8- 10 g)	
1500	738	2,214,000	154,980	32,546	3,255	160,000	80,000	40,000	3,200	3,200	3,200	
1600	787	2,361,600	165,312	34,716	3,472	171,000	85,500	42,750	3,420	3,420	3,420	
1700	836	2,509,200	175,644	36,885	3,689	182,000	91,000	45,500	3,640	3,640	3,640	
1800	886	2,656,800	185,976	39,055	3,905	193,000	96,500	48,250	3,860	3,860	3,860	
1900	935	2,804,400	196,308	41,225	4,122	204,000	102,000	51,000	4,080	4,080	4,080	
2000	984	2,952,000	206,640	43,394	4,339	215,000	107,500	53,750	4,300	4,300	4,300	
2100	1,033	3,099,600	216,972	45,564	4,556	226,000	113,000	56,500	4,520	4,520	4,520	
2200	1,082	3,247,200	227,304	47,734	4,773	237,000	118,500	59,250	4,740	4,740	4,740	
2300	1,132	3,394,800	237,636	49,904	4,990	248,000	124,000	62,000	4,960	4,960	4,960	
2400	1,181	3,542,400	247,968	52,073	5,207	259,000	129,500	64,750	5,180	5,180	5,180	
2500	1,230	3,690,000	258,300	54,243	5,424	270,000	135,000	67,500	5,400	5,400	5,400	
2600	1,279	3,837,600	268,632	56,413	5,641	281,000	140,500	70,250	5,620	5,620	5,620	
2700	1,328	3,985,200	278,964	58,582	5,858	292,000	146,000	73,000	5,840	5,840	5,840	
2800	1,378	4,132,800	289,296	60,752	6,075	303,000	151,500	75,750	6,060	6,060	6,060	
2900	1,427	4,280,400	299,628	62,922	6,292	314,000	157,000	78,500	6,280	6,280	6,280	
3000	1,476	4,428,000	309,960	65,092	6,509	325,000	162,500	81,250	6,500	6,500	6,500	
3100	1,525	4,575,600	320,292	67,261	6,726	336,000	168,000	84,000	6,720	6,720	6,720	
3200	1,574	4,723,200	330,624	69,431	6,943	347,000	173,500	86,750	6,940	6,940	6,940	
3300	1,624	4,870,800	340,956	71,601	7,160	358,000	179,000	89,500	7,160	7,160	7,160	
3400	1,673	5,018,400	351,288	73,770	7,377	369,000	184,500	92,250	7,380	7,380	7,380	
3500	1,722	5,166,000	361,620	75,940	7,594	380,000	190,000	95,000	7,600	7,600	7,600	
3600	1,771	5,313,600	371,952	78,110	7,811	391,000	195,500	97,750	7,820	7,820	7,820	
3700	1,820	5,461,200	382,284	80,280	8,028	402,000	201,000	100,500	8,040	8,040	8,040	
3800	1,870	5,608,800	392,616	82,449	8,245	413,000	206,500	103,250	8,260	8,260	8,260	
3900	1,919	5,756,400	402,948	84,619	8,462	424,000	212,000	106,000	8,480	8,480	8,480	
4000	1,968	5,904,000	413,280	86,789	8,679	435,000	217,500	108,750	8,700	8,700	8,700	
4100	2,017	6,051,600	423,612	88,959	8,896	446,000	223,000	111,500	8,920	8,920	8,920	
4200	2,066	6,199,200	433,944	91,128	9,113	457,000	228,500	114,250	9,140	9,140	9,140	
4300	2,116	6,346,800	444,276	93,298	9,330	468,000	234,000	117,000	9,360	9,360	9,360	
4400	2,165	6,494,400	454,608	95,468	9,547	479,000	239,500	119,750	9,580	9,580	9,580	
4500	2,214	6,642,000	464,940	97,637	9,764	490,000	245,000	122,500	9,800	9,800	9,800	
4600	2,263	6,789,600	475,272	99,807	9,981	501,000	250,500	125,250	10,020	10,020	10,020	
4700	2,312	6,937,200	485,604	101,977	10,198	512,000	256,000	128,000	10,240	10,240	10,240	
4800	2,362	7,084,800	495,936	104,147	10,415	523,000	261,500	130,750	10,460	10,460	10,460	
4900	2,411	7,232,400	506,268	106,316	10,632	534,000	267,000	133,500	10,680	10,680	10,680	
5000	2,460	7,380,000	516,600	108,486	10,849	545,000	272,500	136,250	10,900	10,900	10,900	
5100	2,509	7,527,600	526,932	110,656	11,066	556,000	278,000	139,000	11,120	11,120	11,120	
5200	2,558	7,675,200	537,264	112,825	11,283	567,000	283,500	141,750	11,340	11,340	11,340	
5300	2,608	7,822,800	547,596	114,995	11,500	578,000	289,000	144,500	11,560	11,560	11,560	
5400	2,657	7,970,400	557,928	117,165	11,716	589,000	294,500	147,250	11,780	11,780	11,780	
5500	2,706	8,118,000	568,260	119,335	11,933	600,000	300,000	150,000	12,000	12,000	12,000	
<b>5600</b>	2,755	8,265,600	578,592	121,504	12,150	611,000	305,500	<b>152,750</b>	12,220	12,220	12,220	
Assumptions: 1. "jack" % = 1.6% 2. Fecundity = 3000 3. Egg-to-emergence = 7% 4. Fry-to-smolt = 21% 5. Smolt-to- adult = 10% = ~2.1 Return per spawner						<b>Highlighted indicates proposed adult removals in 2006 and replacement stocking recommended for 2007.</b>			Assumptions: 1. Fry-to-adult - 2% 2. Fingerling-to-adult - 4% 3. Presmolt-to-adult - 8% Note: survivals are less than for Table 2 to account for interactions w/resident fish and smaller presmolt stocking size.			

<sup>a</sup> Presmolt stocking is recommended because late fall stocking should reduce competition for food with resident fish (majority should emigrate the following spring) and growth characteristics from scale patterns can be used to identify these fish when they return as adults.



## **APPENDIX C. GUIDELINES FOR REPLACEMENT STOCKING OF SCKEYE SALMON**



**Appendix C1.**—Guidelines for “replacement” stocking (backstocking) of sockeye salmon as applicable to adult removals from Afognak, Malina and Saltery Lakes in 2007.

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(The following text is from Dan Moore, Fishery Biologist, Division of Commercial Fisheries, SW Genetics, Anchorage)

There are currently about 12 “backstocking” projects (including Malina or Afognak and Saltery) statewide. Eight are in the south central/Kodiak area and 8 of the 12 are sockeye projects. Only two (Malina or Afognak and Saltery) will be conducted as a replacement for broodstock removed for other enhancement projects.

Backstocking is a high risk practice with regards to viability of the wild stock. Deleterious effects can include changed run timing, change in adult size, reduced spawning success and other reductions in fitness.

(The literature is rich with examples of supplementation/backstocking projects that have not had the results hoped for by the managers. To be fair, these are mostly from the lower 48 but then we have not examined our projects to the extent they have outside. We do not want to repeat these mistakes).

Specific guidelines:

1) Collect eggs from throughout the duration of the run in proportion to their occurrence in the natural population. Also spawn adults randomly with respect to age and size.

(Randomizing selection of spawning pairs during the egg take will maximize genetic variability. Selecting individuals for anthropogenic reasons may decrease the genetic viability of the population. Propagating eggs from only one portion of the return could select for that particular segment of the population and result in shifts in the timing of subsequent returns of adults, their age and size composition).

2) When taking eggs from a system with multiple spawning locations do not combine the different populations (e.g. inlet and outlet spawners).

(The separate populations may exhibit different return timings, different rheotactic responses and may be adapted to specific temperature regimes and other environmental parameters in their spawning environments).


3) When returning progeny to an egg take site containing wild fish, the progeny should not exceed a 1:1 wild/cultured ratio. This applies to all life stages. Return the progeny to the egg take site


(The 1:1 ratio may not apply in certain rehabilitation projects, determined on a case by case basis. No examples of this scenario come to mind).

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**SIGN-OFF for the 2007 Pillar Creek Hatchery Annual Management Plan**


  
\_\_\_\_\_  
Gary Byrne: Pillar Creek Hatchery Manager, KRAA  
Date 7-5-07

  
\_\_\_\_\_  
Steve Schrof: Regional Resource Development Biologist, CFD  
Date 6/21/07

  
\_\_\_\_\_  
David Sterritt: Regional Finfish Management Supervisor, CFD  
Date 6-25-07

  
\_\_\_\_\_  
Steve Honnold: Regional Finfish Research Supervisor, CFD  
Date 6/25/07

  
\_\_\_\_\_  
Jeff Wadle: Area Finfish Management Biologist, CFD  
Date 7/17/07

  
\_\_\_\_\_  
Jim McCullough: Regional Supervisor, CFD  
Date 6/28/7

  
\_\_\_\_\_  
Len Schwarz: Area Biologist, SFD  
Date 7/3/07

  
\_\_\_\_\_  
James Hasbrouck: Regional Supervisor, SFD  
Date 7/9/2007

  
\_\_\_\_\_  
Kevin Brennan: Executive Director, KRAA  
Date 7-5-07

The 2007 Hatchery Management Plan for PCH is hereby approved:

  
\_\_\_\_\_  
Denby S. Lloyd: Commissioner, ADF&G, Juneau  
Date 7/27/07